NETWORK WORLD

THE NEWSWEEKLY OF ENTERPRISE NETWORK COMPUTING

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LAN Server *blues*

IBM's net operating system addresses work group needs, but its directory service doesn't pack much of an enterprise punch.

See review, page 48.

Nature sends wake-up call

Earthquake, deep freeze put disaster plans to test.

BY ROSEMARY CAFASSO

Users from coast to coast wrestled with nature's nightmares last week and, for the most part, came out victorious, thanks to well-prepared disaster plans and the use of fault-tolerant networking technologies.

"Despite all the troubles California may be having because of the earthquake, it has not affected our telecommunications system," said Robert Casanova, director of information systems (IS) at Litton Industries, Inc. in Beverly Hills, Calif. A series of self-healing fiber rings from Pacific Bell performed as billed, keeping the links to Litton's nationwide T-1 net alive (see story, page 3).

EARTH QUAKE

At week's end, California state officials were estimating that damage from the quake that left at least 50 dead and 20,000 homeless could reach $30 billion.

Meanwhile, record-breaking cold in the eastern half of the country forced businesses to close — including federal government offices in Washington, D.C. on Wednesday — to lessen the impact of power outages.

But based on interviews with users and leading disaster recovery service providers, the overall impact on IS and networking operations was minimal compared to other recent natural disasters.

Comdisco, Inc. and SunGard Disaster Recovery Services, Inc. reported a total of seven customers had declared disasters and that 34 customers were on alert status in Los Angeles county. By comparison, SunGard alone said that it recorded at least six customers with disaster status

See **Wake-up call**, *page 3*

AP/WIDE WORLD PHOTOS

Flexible frame relay on the way

BY BILL BURCH

Washington, D.C.

The Frame Relay Forum expects to announce at the ComNet '94 trade show here today an implementation agreement for switched virtual circuits (SVC), technology that will give users added flexibility in managing and configuring frame relay nets.

When available, SVC-based services will enable companies to use frame relay to establish temporary high-speed connections to any location. Users today are limited to building frame relay nets with permanent virtual circuits (PVC) that support only predefined, specific locations.

The implementor's agreement, which ensures service interoperability, paves the way for some half dozen carriers to launch SVC-based services. It also holds the potential to lower frame relay service fees by lowering carriers' costs.

With PVC-based frame relay services, carriers can save on network overhead by statistically multiplexing traffic, but engineers must still design networks to guarantee customers' committed information rates (CIR).

Having switched connections available will allow carriers to dial up bandwidth as needed to meet user requirements. With lower network costs, carriers would have the option of lowering service charges, said Rajiv Kapoor, forum chairman.

SVC support will also enable carriers to offer Integrated Services Digital Network access to frame relay clouds, said Alan Taffel, forum president. With ISDN relatively inexpensive and fairly ubiquitous, frame relay should trim costs for access, which has usually

See **Frame relay**, *page 80*

At your service? Users rate net support

The 1994 Service and Support Health Plan

Users say vendors could boost the quality of service by:

- Staffing help desks with more qualified technicians
- Building reliability features into products during development
- Customizing service offerings to better fit user needs
- Working with dealers and resellers to improve local support
- Committing more resources to service and support organizations
- Not taking the installed base for granted

GRAPHIC BY SUSAN J. CHAMPENY

BY SKIP MACASKILL

The expression has always been "caveat emptor": Let the buyer beware. But enterprise network users have taken that ancient Latin proverb and shaped it to deliver their own message: Let the *vendor* beware.

The results of the second annual *Network World*/Dataquest Worldwide Services Group "Network Service and Support Survey" are in, and users are generally pleased with the support they're getting from suppliers of key enterprise network components.

NETWORK WORLD'S READER ADVOCACY FORCE R.A.F.

But they're demanding improvements in areas such as ease of use and installation, problem resolution time and telephone support, and they're willing to change vendors if service isn't up to snuff.

While vendors can't answer demands overnight for things like easier to use, more reliable products, they can take some immediate steps to address concerns revealed in the survey — steps that would go a long way in building customer loyalty. Boosting the quality of help desk support and customer hot lines, for example, could mean being more selective on staffing or improving staff

See **Service**, *page 81*

Greek hero comes to users' rescue

BY ADAM GAFFIN

Numbed by the cost of building their own client/server customer information systems (CIS), three Canadian utilities have joined forces on a development project in hopes of saving millions of dollars.

The utilities — Canadian Western Natural Gas, Ltd. in Calgary, Alberta; B.C. Gas, Ltd. in Vancouver; and Union Gas, Ltd. in Chatham, Ontario — have dubbed their joint effort the Theseus Consortium. The name, which refers to the legendary Greek hero who slew the Minotaur in the labyrinth of ancient Crete, stemmed from the feeling that the companies have taken on a project of beastly proportions.

The consortium has pegged client/server-based CIS development costs at $27 million.

CISs, essentially large databases, are indispensable for utilities and other types of companies because they store the data needed to issue bills, such as customers' addresses and information about their monthly energy use. The new client/server-based systems are expected to be easier to maintain and upgrade than existing host-based systems, and they promise to give end users improved information access.

In the midst of a five-year project with systems integrator IBM, the consortium has pegged CIS development costs at $27 million — a far cry from the $40 million to $50 million apiece they figured on spending to develop their own systems.

When the new systems begin rolling out later this year, the mainframes supporting the existing CISs will be transformed into giant servers on the new client/server-based networks, each of which will span a province. Local networks in individual offices will be connected to one another and the central

See **Rescue**, *page 80*

Are You Ready?

It's a jungle out there. And your people are demanding bigger, faster and more diverse services. Like E-mail, video conferencing. LAN interconnection and high-speed data transmission. This means your network is growing in size and complexity. That's why you should call on your local phone company. Your phone company is backed by the products and services of AT&T and AT&T Bell Laboratories. That makes it easier for them to give you the quality and reliability you need. So it'll be easier for you to get your service up. To get all your people hooked up. And to keep your network up. Plus, your phone company can provide all the bandwidth you demand, on demand. So call your local phone company. Because it could mean the difference between data networking and data not working.

AT&T And Your Local Phone Company. Technologies For The Real World.

AT&T
Network Systems

Recent events suggest the administrative burdens of your network could grow substantially.

Briefs

3Com: Acquisition central. Continuing its spending spree, 3Com Corp. last week announced plans to acquire remote access server vendor Centrum Communications, Inc. for $36 million. The deal, expected to be completed within 30 days, comes just weeks after 3Com agreed to buy Ethernet switch vendor Synernetics, Inc. The Centrum agreement will provide 3Com with dial-up routing technology that allows individual remote users, such as business travelers, to access resources on corporate local-area networks.

Novell goes Platinum. Novell, Inc. last week introduced the Platinum Electronic Communications System to help its large resellers provide better customer service and support.

The new system, based on NetWare Global Message Handling Service and several third-party electronic mail packages, will give resellers an improved way to exchange information with Novell and other resellers.

BMC Software on the Patrol. BMC Software, Inc., a vendor of Systems Network Architecture software, last week acquired Patrol Software for $33.7 million. Patrol makes smart agent software modules that can gather information about non-SNA devices and report it to a central enterprise manager. BMC said it will incorporate the smart module technology into its products.

Touching InterBase. Borland International, Inc. last week announced a new version of its InterBase database server software featuring improved data integrity, support for multiple simultaneous users and adherence to the ANSI SQL 2 standards. InterBase 4 is a fundamental piece of Borland's strategy to help users of its Paradox and dBase desktop databases upsize to server-based systems. While the product will be available later this year, specific availability and pricing information was not disclosed.

HP dabbles with DCE. Hewlett-Packard Co. this week will announce additions and enhancements to its Open Software Foundation, Inc. Distributed Computing Environment (DCE) software. HP will announce a gateway to foster interoperability between DCE Encina transaction processing servers and mainframe-based transaction processors. HP will also unveil administration and configuration enhancements for its DCE/9000 products.

In addition, the company will also roll out DCE directory services, a distributed file system based on Transarc Corp.'s Andrew File System, and a gateway that links the DCE file system to Sun Microsystems, Inc.'s Network File System. The enhancements will be available by July.

Hearst going on-line. The Hearst Corp. today plans to announce its foray into on-line communications, promising an "interactive communications system" for consumers. The company, best known for its newspapers and magazines, now has a New Media and Technology Division, headed by Alfred Sikes, former chairman of the Federal Communications Commission.

Hearst: (212) 649-2000.

Frame relay cure for SmithKline Beecham. Pharmaceutical giant SmithKline Beecham last week announced it has signed a three-year, $50 million contract with Sprint Corp. to build a global data network using frame relay and X.25 services.

So far, Sprint has turned on five frame relay nodes for the user in the U.S. The first of 17 frame relay nodes for Asia and the Pacific Rim is now operating, and 34 frame relay nodes are planned for Europe. The network will also include Global Virtual Private Network and 800 services.

Contacts

ADDRESS: Network World, 161 Worcester Rd., Framingham, MA 01701. PHONE: (508) 875-6400; FAX: (508) 820-3467; INTERNET: network@world.std.com.; BBS: Interact with other readers: download free software, submit letters to the editor, leave news tips, change of address requests or hunt for jobs by using your IBM, Apple or other computer to dial into the BBS at speeds up to 9.6K bit/sec by dialing (508) 620-1178 or (508) 620-1160. READER ADVOCACY FORCE (R.A.F.) HOTLINE: Contact us with story tips about pressing user issues, (800) 622-1108, Ext. 487; NETWORK HELP DESK: Contact Dana Thorat via any of the above means.

Network HELP desk

Network World *tracks down answers to your questions regarding products, services, technologies or disputes with vendors. Please submit questions to Dana Thorat at (800) 622-1108, via fax at (508) 820-3467, via the Internet at djt@world.std.com or via CompuServe at 73244,2673.*

Is there any way for users to log on to our Novell, Inc. NetWare network from within Microsoft Corp. Windows?

Marc Brillon, Pawtucket, R.I.

Ronald Nutter, escalation manager of 900 Support, a 24-hour, seven-day-per-week NetWare technical support company in Lake Oswego, Ore., replies:

Logging on to NetWare from within Windows is not recommended because Windows cannot tolerate the DOS environment changing once Windows is up and running.

As a result of logging on to NetWare from within Windows, you could experience unpredictable Windows operations, such as a sudden change in the DOS path statement or drives that don't map correctly.

We wired our office space for Arcnet several years ago thinking it would serve our purposes for many years to come. We are now looking to move to Ethernet or 10Base-T. Since we only have a couple of years left on our lease we are wondering how we might be able to use the existing wiring with our new Ethernet network interface cards (NIC).

David Ransdell, Portland, Ore.

Dennis Callagy, director of The Asset Group, a 24-hour support program for organizations running enterprise networks, responds:

Whether or not you will be able to use your existing wiring with your Ethernet NICs depends on the type of wiring that your site has.

If your site is not currently using all eight wires straight through (in other words, all eight wires are not directly connected to each RJ-45 connector) then you would need to rewire to the IEEE 802.3 10Base-T standard for Ethernet. 10Base-T uses two pairs of wire, which correspond to Pins 1 and 2, and Pins 3 and 6 on the connector. If the pairs are not configured this way,

See **Help desk**, *page 67*

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PRO/CON

Emerging from the training grounds, representatives from vendor- and nonvendor-specific camps square off.

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Wake-up call

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and nearly 40 customers on alert during the 1989 San Francisco quake.

Throughout the week, Comdisco and SunGard also had customers on alert status because of possible power outages in the Midwest and East Coast. On Wednesday, Comdisco had 17 customers on alert in these regions, said Vic Fricas, a senior vice president at the company.

"We are taking alerts across the country," added Jim DiBrino, executive vice president of operations at SunGard. "We've been having rolling power outages, and as far south as Atlanta, we've had freezes. I think it's very significant, perhaps as significant as the earthquake, but no one wants to hear that."

Frank Erbrick, senior vice president and chief information officer at United Parcel Service, said the company's Los Angeles sorting facility was damaged with at least four employees sustaining minor injuries when the predawn earthquake hit on Monday, registering 6.6 on the Richter scale.

But UPSNet, the company's nationwide network, did not take a hit. "We lost no connectivity," Erbrick said. UPSNet was built with fault-tolerant mechanisms, so that every major switch on the network has two or, in some cases, three feeds. If one is knocked out, data is dynamically routed to the other switch.

In fact, Erbrick said he was as concerned with the potential disaster lurking around his Mahwah, N.J., data center. The deep freeze caused many utility companies to institute rolling blackouts, which would temporarily shut off power to one region to feed another.

Erbrick said UPS volunteered to run its data center on generator power until one of the units blew a piston rod. He was forced to request power back from the utility company and the two remaining diesel-powered generators carried the load until power was restored.

Tom Loane, vice president of computer services at Alamo Rent A Car, Inc. in Fort Lauderdale, Fla., said he was feeling extremely lucky last week. The company has an ongoing "bulletproofing" program for its seven global data facilities, one of which sits alongside Los Angeles International Airport.

Alamo completed a $250,000 revamp of its Los Angeles facility last year that included uninterruptible power supplies, generators, backup air conditioning units and "nailing things to the wall," Loane said.

"The network didn't fail," he said. "We lost two circuits on the net, one in Burbank and [one in] Palm Springs, but by the time those places were opened, service was restored."

Local Internet connections likewise survived the Los Angeles earthquake largely intact. The first Usenet message from Los Angeles about the earthquake was posted just 10 minutes after it happened. Within an hour of the earthquake, Los Angelenos with Internet access were discussing it on "channels" set up for the purpose on Internet Relay Chat, a real-time network chat system.

Pushpendra Mohta, director of engineering for CERFNet, a major Internet provider in the area, said only one of his network's hubs was knocked out.

The hub, at the University of California at Los Angeles, had its power shut off when water from a ruptured pipe flooded a basement computer room, he said.

"I think it is safe to say that while voice calls were being blocked, the dedicated data networks pretty much stayed up and the outages where they occurred were almost always due to power losses or when the [universal power supply generators] ran out of juice," Mohta said.

But the picture wasn't entirely rosy.

According to Paul Gubitosa, director of computer services at Joseph E. Seagram & Sons, Inc. in New York, the company was still evaluating the extent of damage at a division in Sherman Oaks, Calif. "First, we are emphasizing safety," he said. "No one is in the building at this point."

The Sherman Oaks facility is a Seagram sales division employing about 40 people. Gubitosa's corporate computer operations provides service, and he reported that the division had not yet determined if they would need special assistance from his group.

In other regions, the cold took its toll.

"The pipes froze and burst in our Rockville [Md.] office, flooded equipment and brought down the T-1 line that connects that remote office with the main offices in D.C.," said Venkat Gopalan, director of engineering services at a Washington, D.C.-based government contracting services firm. "It's still down now; it's been down for two days," he said on Friday.

Some observers said smaller companies on both coasts may have been the hardest hit because they typically cannot afford the backup systems and service contracts that large corporations rely on.

NW staff contributed to this article.

Users' networks for the most part survived the Los Angeles quake in good shape, despite the widespread destruction it caused.

AP/WIDE WORLD PHOTOS

EARTH QUAKE

Be prepared

How to safeguard your network against disaster.

- Ensure that buildings have multiple points of egress and ingress.
- For each site, employ multiple local carriers or use several services from a single carrier.
- Make sure long-haul carriers have multiple points of presence within a single metropolitan area.
- Run mission-critical applications on easily replaceable, nonproprietary hardware.
- Spread data centers throughout buildings, campuses and the enterprise.
- Schedule daily backups for all essential data.
- Rotate backup data to multiple off-site locations.
- Devise disaster recovery strategy.
- Test recovery plan in nonemergency situation.

SOURCE: SUNGARD RECOVERY SERVICES, INC. WAYNE, PA.
GRAPHIC BY SUSAN SLATER

Recent network-shaking disasters

GRAPHIC BY SUSAN SLATER

Fiber rings shake off quake

Aside from knocking out commercial power and forcing carriers to go to battery backups and diesel generators, last week's earthquake did little harm to GTE Corp. and Pacific Bell fiber rings in Los Angeles.

Both carriers have a number of fiber rings in the area, including some serving customers near the quake's epicenter in the San Fernando Valley. While many businesses near the epicenter suffered extensive damage, all the GTE and Pacific Bell rings appear to have come through the quake unscathed, although only preliminary reports were available at press time.

Pacific Bell has 14 fiber rings and 40 point-to-point fiber connections serving 240 customers in the Los Angeles basin, including two rings and a half-dozen point-to-point connections in the San Fernando Valley. All the rings are designed to reroute traffic around a break within milliseconds, and the carrier's point-to-point connections are backed up by hot standby lines, said Diane Holguin, regional manager for Pacific Bell's Los Angeles business unit.

As of midweek, the carrier's only problem had been the power outage that began with the quake early Monday morning and lasted until Wednesday morning, when power was restored. To cope with the outage, the carrier relied on on-site batteries and diesel generators.

Like Pacific Bell, GTE reported that its Los Angeles fiber came through the quake fully operational. The carrier has 20 rings — eight Synchronous Optical Network (SONET) and 12 non-SONET rings — serving 85 nodes in the Los Angeles basin.

However, the quake caused problems on the voice side. It shut down GTE's Pacoima central office on the eastern edge of the Valley, and 11,000 customers were without service until 6 p.m. Monday evening.

BY BILL BURCH

San Fran revamps radio net

Having learned a hard lesson from the Loma Prieta earthquake of 1989, San Francisco is working feverishly to consolidate disparate radio networks that serve seven public service agencies but do not communicate with one another.

The autonomy of the agencies in the 1989 disaster resulted in chaos, said Dan McFarland, general manager of San Francisco's department of electricity and telecommunications.

"Because the agencies couldn't communicate with each other, we sometimes had too many vehicles going to one incident and none going to another," he said.

McFarland added that a similar network arrangement exists today in Los Angeles.

In November 1993, San Francisco received budgetary go-ahead for a $50 million project under which it will install an 800-MHz radio system from Motorola, Inc. that will internetwork the police and fire departments, city paramedics, school districts and other agencies. The idea is to allow the various entities to speak to one another on one channel, assess the severity of a situation and rethink resource deployment on the fly as conditions change.

The system is a private branch exchange-like trunked radio system that can terminate 28 frequencies. It will replace a nearly 25-year-old system running in the 450-MHz band.

The city is also revamping its 911 system to the tune of $25 million to consolidate all the dispatch functions for the city and county, McFarland said. At the time of Loma Prieta, 911 calls would come into the police department, which would transfer them to various emergency agencies with little or no coordination of the resulting dispatch activity.

The city is also extending the reach of its network by installing a simulcast system and radio towers throughout the city. Today, with the use of a single tower, there is about 95% citywide coverage, which is not enough to allow public service officials in high-rise buildings or underground locations to communicate.

BY JOANIE WEXLER

If Anything Ever Comes Out Of There, It'll Be Through A Cisco Router.

It's amazing how far your sphere of influence can reach, once you get your hands on the right routers. No matter how big your network grows, Cisco will help you spend less time managing it, without adding personnel. With CiscoWorks,™ a series of easy-to-use software applications, you can manage your router network automatically from one central location. CiscoWorks automates tasks such as monitoring and controlling configurations for all your routers. You can send commands, including security password updates, to multiple router sites. Easily maintain inventory of router operating software. And distribute control over various groups of routers. Only Cisco routers give you these capabilities. So follow the leader. Call Cisco today at 1-800-859-2726. We'll show you a way to manage a growing network that will save your company both time and money. Today, and for many, many light years to come.

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Latest T-1 ATM pledge causes stir

BY JOANIE WEXLER

Washington, D.C.

Sprint Corp. last week became the second major carrier to promise Asynchronous Transfer Mode (ATM) services at T-1 speeds, increasing pressure on users to examine the trade-offs of using the overhead-heavy technology at narrowband transmission rates.

Sprint, which said it would offer T-1 ATM access in the fourth quarter, follows rival AT&T's November pledge to deploy such services during the second half of the year (*NW,* Nov. 15, 1993, page 33).

Observers agreed that ATM, originally slated to run at broadband speeds, has technical drawbacks at 1.544M bit/sec that can render it less economical than same-speed frame relay or leased lines.

However, they acknowledged that T-1 ATM will be necessary for the technology to thrive. The reason: Pricey T-3 lines remain a huge obstacle to companies wishing to get their feet wet with ATM.

"Low-speed ATM comes down to money," said Dave Beering, staff telecommunications analyst at Amoco Corp. in Chicago, who is planning a global ATM trial (*NW,* Jan. 17, page 1). "If the starting point is T-3, carriers won't be able to sell much of it."

Tom Nolle, president of CIMI Corp., a consulting firm in Voorhees, N.J., agreed. "What T-1 ATM is trying to do is lower the cost threshold so people can afford to test it. If they can't, it won't survive."

Pricing for ATM at T-1 rates has not yet been clearly established by the carriers. Nolle estimated that T-3 prices average about $4,000 per month, compared with $800 to $900 for a T-1 line.

Observers were able to cite few technical reasons for turning to the technology as it stands today. Some reasons are the absence of key standards for optimizing transmission of multimedia applications and the lack of usefulness of the technology for data-only applications compared with frame relay.

"If you're only sending packet data, there is very little technical reason to go with ATM," said Fred Sammartino, president of the ATM Forum.

There is also a dearth of products today that let users tap into ATM's touted strengths for mixing video and voice with data at T-1 rates. "I'd bet there are none," said Cathy Gadecki, Sprint's product manager for ATM services. She predicted products will appear for placing voice traffic into cells by year end.

Also, there are no standards for putting statistically multiplexed voice and video into cells in a common way, said Steven Taylor, president of Distributed Networking Associates, a consultancy in Greensboro, N.C. So the user must send the voice and video in circuit-emulation mode, rendering it analogous to traditional time-division multiplexing.

ATM overhead uses a minimum of 11% of net bandwidth, depending on class of service. Sammartino said the carriers have indicated ATM prices will be lower than leased-line costs; in AT&T's case, about 15% lower. So for T-1 ATM to make economic sense, prices must be lower than those of vanilla T-1 links by a percentage greater than that of the accompanying percentage overhead.

However, the fact that ATM equipment cannot currently differentiate a voice or video cell from a less time-sensitive data cell "is a critical item for maintaining class of service throughout the network," said Stephen Elliott, senior communications analyst at Halliburton Co., an oil field services business in Dallas.

Halliburton is interested in ATM for consolidating what are now separate facilities for voice, data and video, and plans to test the technology at year end.

Senior Washington Correspondent David Rohde contributed to this report.

Is it worth it?

ATM at T-1 speeds offers few advantages over circuit-switched T-1 or frame relay.

Pros

- Makes Asynchronous Transfer Mode (ATM) more affordable for the masses, particularly for experimenting.
- Supports seamless connection of smaller sites to high-speed ATM backbones.

Cons

- No standard for interleaving mix of ATM-based voice, data and video at T-1.
- Dearth of even proprietary equipment for statistically multiplexing mix of traffic over ATM.
- Minimum of 11% overhead eats into T-1's 1.5M bit/sec bandwidth.

SOURCE: DISTRIBUTED NETWORKING ASSOCIATES, GREENSBORO, N.C.
GRAPHIC BY SUSAN J. CHAMPENY

AT&T ports voice mgmt. to SNMP platforms

BY JOANIE WEXLER

Basking Ridge, N.J.

AT&T propelled corporate voice and data networking departments further down their inevitable collision course last week with the announcement that it is porting its proprietary voice-oriented management applications to SNMP-based platforms.

The company this summer plans to ship a fault identification application for Unix-based management systems to bring its Definity G3 private branch exchange under a common management umbrella with local-area network gear. The move paves the way for companies to gain a measure of cohesive control over their voice and data networks, users and analysts said.

Other AT&T applications that measure network performance and manage call accounting will be ported to Simple Network Management Protocol-based management systems, said Susan Barbier, AT&T market manager for Definity systems and network management. SNMP ports are also in the works for management applications that support AT&T PBXs other than the Definity G3, as well as AT&T voice response and call management systems, she said.

"Our customers are saying they need to manage the PBX from the same data management station that manages their hubs, routers and the like," Barbier said.

The company has already ported the fault management application to Hewlett-Packard Co.'s OpenView and its own StarSentry platforms. It also has partnered with Cabletron Systems, Inc. to allow users of the hub vendor's Spectrum enterprise manager to combine their views of voice and data networks.

AT&T said it will demo the application on the three platforms at this week's ComNet '94 show in Washington, D.C. and will have it ready to ship on all three platforms by midyear.

The moves could be a boon to Blue Cross/Blue Shield of Connecticut, where the lines between voice and data network staffs are blurring, said Graham Morrison, project leader for net design and engineering at the North Haven, Conn., insurer.

The insurance company runs an AT&T PBX and is a Spectrum shop. Morrison, who hopes to get beta versions of the applications, pointed out that moving users requires separate reconfigurations for voice and data connections, as users today have separate links to each environment.

"We would save labor and facilities planning time if we could do this with one tool," he said.

Gary Andresen, principal analyst at consultancy Dataquest, Inc. in San Jose, Calif., said this is a goal of many companies.

"Most want an integrated world where they can administer changes to a whole network from a single point," he said.

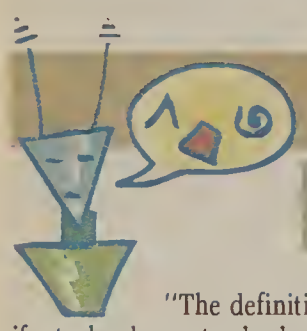
Morrison said AT&T is finally taking to heart the idea that voice and data will converge. "They are realizing they must be part of the revolution if their switch is going to survive in corporate networks."

To bring its telephony gear into the data management world, AT&T has developed applications based on an SNMP proxy agent that translates AT&T Definity G3 proprietary messages to SNMP-standard messages.

Users can click on a Definity icon under their data management system's interface and dig down to the port level to find trouble spots, she said.

The capabilities afforded by the applications, expected to cost about $20,000, reach beyond AT&T's Accumaster Integrator product, which manages only AT&T voice and LAN products. AT&T is no longer actively marketing Accumaster, Barbier said.

To date, only a few vendors have tried to blend LAN and voice net management. MAXM Systems Corp. in Vienna, Va., for one, has its own platform — which can integrate with OpenView and IBM's NetView/6000 — for managing telephony equipment and LANs, a MAXM spokeswoman said.



CyberSpeak: *Voices from the reader network.*

The White House is trying to define "broadband interactive digital services" for a new section of the Communications Act. How would you define them?

"The definition should specify technology standards and reasonable rates, whatever those would be. To help business in general — if the whole idea of telecommuting could be facilitated — your place of business would have to be on the net as well as your home, [and both places would have to run on] whatever media is required. My personal opinion is that copper won't cut it, but I'm not sure [the government is] willing to shell out the money for fiber everywhere. I don't have any problem with the network being available everywhere, but I don't necessarily think it's everyone's God-given right to get it free or even cheap. There is no free lunch anymore; if you use the service, you pay for it."

Kent Worrell, information center manager, Metropolitan Pier and Exposition Authority, Chicago

"Whatever BIDS — if they end up calling it that — means won't really matter unless you're a big commercial user that gets either T-1 or T-3 services from a major carrier like AT&T or MCI. The cost of delivering that kind of service is going to be too great for the average user to shoulder."

John Edwards, LAN administrator, Massachusetts Registry of Motor Vehicles, Boston

"If those digital services are going to be broadband, then they have to support high-resolution video, graphics and information. The interactive part is fairly obvious: It has to do something when you poke it."

John McConnell, president, McConnell Consulting, Inc., Boulder, Colo.

"There are understandable definitions for each of the individual words of that title. But when an industry refers to a single service as the combination of those words, it shows that the people driving that industry are not focused on the general users. Broadband interactive digital services is a title that can only be understood by an in-house telecommunications expert in a very large corporation."

Roald Steen, correspondent, *Telecom Revy,* Minneapolis

NextWeek CyberSpeak Out!

The L.A. earthquake and the deep freeze in other parts of the U.S. have done massive damage. How did your net stand up to Mother Nature?

Responses must be registered by 5 p.m. Thursday, Jan. 27

INTERNET: network@world.std.com * COMPUSERVE: 73244,2673 * FAX: (508) 820-3467 * RAF HOTLINE: (800) 622-1108, EXT. 487

CORRECTIONS

In Mark Gibbs' column "1993: The year in retrospect" (Jan. 10, page 25), the phone number for information on his *Network World* seminars was incorrect. The correct number is (800) 643-4668.

The Jan. 10 story "DOD plan may cut ties to Internet" gave incorrect product and manufacturer names for a mail exchange record server. Raptor Systems, Inc. manufactures the Eagle software referenced in the story.

If Networks Were Founded On The Idea That People Work Better Together, Why Install Modems That Work Apart?

It seems obvious, doesn't it? The better your modems work together, the better your LAN and your remote users will work together.

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Interlink offers potent TCP/IP software for MVS

BY MICHAEL COONEY

Freemont, Calif.

Interlink Computer Sciences, Inc. will this week roll out a new version of its TCP/IP software for MVS mainframes that promises to support more users for less money than the competing IBM product.

Interlink's SNS/TCPaccess 2.0, which resides on the MVS mainframe and implements a full protocol stack, enabling the host to run Transmission Control Protocol/Internet Protocol applications and communicate with devices on TCP/IP nets.

SNS/TCPaccess 2.0 supports 5,000 tn3270 sessions, 5,000 native TCP/IP sessions or any combination of the two. Version 1.1, which is nearly two years old, supported a maximum of 500 tn3270 or TCP/IP sessions — about the same as IBM's mainframe TCP/IP software.

"The number of users supported is only limited by the size of the mainframe," said Chuck Jepson, president and chief executive officer of Interlink. Chris Markle, director of marketing for Interlink, said Version 2.0 provides better performance than IBM's TCP/IP for MVS software or TCP/IP off-load facilities from IBM, McDATA Corp. and others.

With such facilities, TCP/IP protocol processing is performed on host gateways such as IBM's 3172 Interconnect Controller. That frees up the host CPU and improves performance by at least 30%, IBM has said.

Interlink undercuts IBM

Interlink	IBM
SNS/TCPaccess 2.0	TCP/IP for MVS
$18,000-$62,000	$20,000-$67,000
CICS Module 4	CICS interface
About $20,000	Up to $23,000

Prices vary, depending on processor size.

SOURCE: IBM, WHITE PLAINS, N.Y., AND INTERLINK COMPUTER SCIENCES, INC., FREMONT, CALIF
GRAPHIC BY TERRI MITCHELL

"We've reengineered our code to run more efficiently on the mainframe," Markle said. "tn3270 sessions take about 40% less of mainframe CPU cycles than IBM's TCP/IP for MVS running on a 3172."

"We'll be going to the 2.0 version as we add more users and client/server applications," said John Harrington, manager of the data center at Madison Gas & Electric in Madison, Wis. "We evaluated the IBM TCP/IP suite for the mainframe and chose Interlink because it was written specifically for the MVS system [IBM TCP/IP for MVS was ported from the VM platform]."

Interlink also added two applications that will run on top of its TCP/IP product.

SNS/Network File System (SNS/NFS) 2.0 lets the mainframe become a file server for high-speed bidirectional file transfers or a big backup server for NFS users on a local-area network, Markle said. Enterprise Print Services 2.0 acts as a gateway between a TCP/IP and Systems Network Architecture net and lets SNA users utilize printers on the TCP/IP net and vice versa.

Interlink is trying to exploit a window of opportunity, analysts said. Around midyear, IBM is expected to announce its next version of TCP/IP for MVS, which will support more users and improved performance (*NW*, Oct. 4, 1993, page 1).

"Any product that helps keep the mainframe in the picture IBM should be happy about," said Chet Geschickter, director of research at the Hurwitz Consulting Group in Watertown, Mass.

All of the products are available now.

✆Interlink: (510) 659-6381.

Motorola shakes up Codex, UDS subsidiaries

BY JIM DUFFY

Schaumburg, Ill.

Motorola Corp. last week announced it is restructuring its Information Systems Group (ISG), comprised of Motorola Codex and Universal Data Systems, Inc. (UDS) to eliminate overlap and synchronize its activities with those of other company units.

At the same time, Motorola merged ISG with its Paging and Wireless Data Group into a new operating unit called Messaging Information and Media Sector.

Motorola said the moves were made to better focus product engineering, development and strategies. UDS and Motorola Codex both make dial-up and leased-line modems, and data service unit/channel service units.

Motorola Codex's John Lockitt will oversee development and marketing of Motorola Corp.'s switches and muxes.

"There are clear overlaps that we would do well to address," a Motorola Codex spokesman said.

The reorganization, which is effective immediately, could clear up ambiguities enterprise net managers have in selecting data communications gear from a Motorola subsidiary. Though units of the same parent company, UDS and Motorola Codex have been competing for market and mind share.

Both firms will now have distinct product development and marketing responsibilities. Product support and staffing issues, however, still need to be worked out, UDS and Motorola Codex spokespersons said.

Users said it's too early to tell if the reorganization will produce product support hiccups.

"It's possible that there's going to be problems for [support] people who are unfamiliar with the older products that are out there," said Ed Wiest, senior data communications analyst at Executone Information Systems, Inc. in Darien, Conn.

ISG has now been structured into two lines of business: Transmission and Networking. The Transmission line will be headed by James Wagner, president of UDS. It will be responsible for all modem product engineering and development, marketing, distribution and support worldwide.

The Networking line of business will be directed by John Lockitt, who will remain president and chief executive of Motorola Codex. Networking will oversee production, marketing and support of multiplexers and switches, including the recently announced 6950 SoftCell ATM Networking Node.

Wagner and Lockitt will report to Frank Lloyd, ISG vice president and general manager. Motorola will retain the UDS and Motorola Codex brand names.

Analysts said the reorganization will get UDS and Motorola Codex marching to the same beat.

"It's no secret that the relationship [between UDS and Motorola Codex] has been more antagonistic than cooperative over the last several years," said Kathryn Korostoff, president of Sage Network Research in Natick, Mass.

Cooperation between UDS and Motorola Codex, though, will include some shakeout in product lines.

"The UDS people have been working very hard on the high-speed modem end," said Joe Noel, general manager for telecommunications services at Intelliquest, Inc. in Austin, Texas. "Codex also has a lot of experience in the high-speed modem area. One of the obvious things is to integrate the high-speed stuff to come out with a more reasonably priced product."

CLI tunes in new video product line

BY JIM DUFFY

San Jose, Calif.

Compression Labs, Inc. (CLI) last week rolled out a line of videoconferencing systems that features touchscreen panels and adheres to interoperability standards.

CLI's new Radiance line sports four fully assembled models that can support as many as two wide-area network ports ranging in speed from 56K to 2M bit/sec. Each unit features CLI's Self-Guide touchscreen user interface, which provides intuitive control of the Radiance system via menus and icons.

The Radiance line is interoperable with CLI's Eclipse and Rembrandt II/VP systems, and with coder/decoders that meet TSS H.320 standards. This will make them appealing to users with multiple types of conferencing systems.

The new systems can present video at up to 30 frame/sec and 480 lines of resolution. They feature full-duplex audio with built-in digital echo cancellation. In addition, the systems support multipoint videoconferencing with dozens of locations simultaneously.

Radiance was handy for one user during last week's earthquake in Southern California.

"We set it up to communicate with our other office in Hollywood on the project we are working on," said Monica Corbin, marketing coordinator for Pacific Data Images, Inc. located in Sunnyvale, Calif.

"But we haven't had that much of a chance to use it except since the earthquake. We've been able to communicate with our other office when the phones and other things weren't working," Corbin said.

4 radiant models

Available now in the U.S.:

- Single monitor, 15 frame/sec — $45,900
- Dual monitor, 30 frame/sec — $58,900

Available internationally in 2Q 1994:

- Single monitor, 15 frame/sec — $50,900
- Dual monitor, 30 frame/sec — $63,900

SOURCE COMPRESSION LABS, INC., SAN JOSE, CALIF.

Analysts were impressed with the pricing and configuration of the Radiance systems.

"It certainly comes standard with a lot of well-integrated features," said Sarah Dickinson, program director at Personal Technology Research, Inc., a market research firm in Waltham, Mass. "And one of the key points is it does enable interoperability with all standards-based videoconferencing systems and CLI's installed base."

Dickinson also said the video options — 15 or 30 frames per second — will let users start with a videoconferencing system for general meeting purposes and upgrade to near-broadcast quality video for an incremental cost.

✆CLI: (408) 435-3000.

Lotus to air remote cc:Mail for Windows

BY ADAM GAFFIN

Cambridge, Mass.

Lotus Development Corp. this week will announce a version of its cc:Mail electronic mail package designed for mobile Windows-based PC users.

The new version will likely have the same features as the local-area network version of cc:Mail for Windows 2.0, according to Chuck Stegman, a principal analyst at Dataquest, Inc., a consulting firm in San Jose, Calif. These include filters and rules that an end user's personal computer can employ to decide what to do with incoming E-mail, as well as support for the Transmission Control Protocol/Internet Protocol.

A Lotus spokeswoman confirmed the company will announce the product but declined to comment further.

Lotus is behind other vendors, in releasing remote Windows E-mail software, Stegman said. But Lotus could quickly catch up because of cc:Mail's large installed base and the software's features, he said.

Lotus already sells remote versions of cc:Mail for portable DOS and Macintosh computers.

Stegman said delays in releasing version 2.0 of the Windows LAN package, which made its debut in mid-1993, pushed back work on the remote version of the product.

Separately, WordPerfect of Orem, Utah, will launch today its WordPerfect Office Telephone Access Server, letting users send and retrieve electronic messages and other data from a push-button phone.

WordPerfect has licensed Smooth Talker by First Byte, Inc. and will use the technology to convert text messages to audio. This access will require WordPerfect Office running on a PC equipped with IBM OS/2 and at least 8M bytes of memory. The system, scheduled to ship in the second quarter, will cost $9,995.

✆Lotus: (415) 335-6400; WordPerfect: (800) 861-2507.

Senior Editor Rosemary Cafasso contributed to this article.

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You don't have to be using virtual reality to gain from ATM today.

Whether it's for faster information, better communications media or lower communications costs, Newbridge ATM will give you the competitive edge — today. After all, Newbridge ATM systems offer the flexibility, scalability, and manageability that a wide variety of existing high-bandwidth applications already require.

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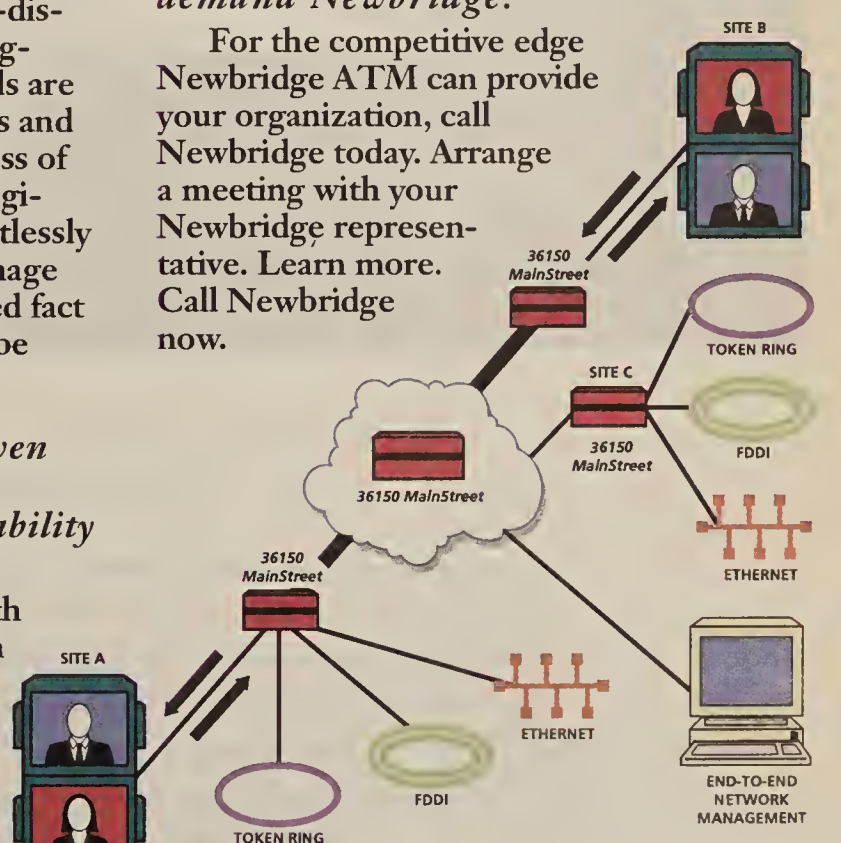
Demand the best; demand Newbridge.

For the competitive edge Newbridge ATM can provide your organization, call Newbridge today. Arrange a meeting with your Newbridge representative. Learn more. Call Newbridge now.



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Federal panel's call to drop GOSIP may end mandates

BY MICHAEL COONEY, JIM DUFFY AND JOANIE WEXLER

The recommendation by a federal government panel to scrap the Government Open Systems Interconnection Profile (GOSIP) procurement mandate may spell the end of such provisos in the network industry.

Purchasing edicts, such as GOSIP, will meet with resistance if they do not include input from users and take into account installed bases of computer equipment and services, said users and companies that work with the federal government.

The GOSIP program, which began in 1990, dictates the use of OSI protocols for intra- and interagency communications. But most government agencies already rely on Transmission Control Protocol/Internet Protocol or proprietary protocols, such as IBM's Systems Network Architecture and Digital Equipment Corp.'s DECnet, for interoperability with other agencies and suppliers.

As a result, government users have ferreted out loopholes under the GOSIP stipulations, allowing them to purchase non-OSI networking gear. It is for this reason that the Federal Internetworking Requirements Panel (FIRP) earlier this month proposed eliminating GOSIP (*NW*, Jan. 17, page 1).

"The bottom line is that the vendors implementing OSI have not brought the products to market that we need," said Doug Harsha, a computer specialist with the U.S. Department of Agriculture in Fort Collins, Colo. "TCP/IP, on the other hand, has been very successful for us."

Robert King, a software engineering specialist at military electronics giant E-Systems in McLean, Va., said computer networking purchase mandates such as GOSIP are unrealistic.

"I don't see [GOSIP] making a lot of sense," said King, who deals mostly with TCP/IP because his company is involved largely in scientific computing. "For somebody doing office automation, they might be perfectly well suited by Novell [Inc.'s NetWare]."

King has seen little, if any, OSI use at one "three-letter" government agency to which his company is providing network maintenance services.

But Joe Mohen, chief technical officer for Proginet Corp., a Uniondale, N.Y., OSI software developer, said purchasing mandates could work if they reflect the realities of the marketplace.

"Rather than say we aren't going to have a mandate," Mohen said, "the government should say we are going to have a mandate, but it will be driven by user requirements, not a bunch of people sitting in an ivory tower telling everyone what to do."

Alhough King said he believes FIRP's recommendation will "pull the rug out" from under OSI, others do not see it that way. They said government users will just add OSI to the mix of multiprotocol transports and applications they use.

"There are certain GOSIP protocols that are ahead [of others] and that really mean a lot to interoperability," said Mike Savage, systems engineering branch chief for information systems at the National Aeronautics and Space Administration Marshall Space Flight Center in Huntsville, Ala. "I think X.500 specifically is considered by most to be very viable and necessary for interoperability in electronic mail and directory services."

Some think the FIRP proposal will lead to a merger of TCP/IP and OSI.

"For IP and GOSIP to at least become costandards reflects reality," said Bruce Almich, technical manager of data communications at the U.S. Environmental Protection Agency in Research Triangle Park, N.C. "We've also run FTAM very well over IP."

The Agriculture Department's Harsha said, "What would be best for everyone is if the TCP/IP and OSI communities would get together and work cooperatively."

OSI users in the private sector, meanwhile, said they will not feel the effects of FIRP's action. Dow Chemical Co., for example, is a large DECnet shop moving to DECnet/OSI.

Ironically, the FIRP recommendation may just be the kicker that OSI needs, said Henk Hazelhoff, associate consultant for corporate information systems at Dow.

"I would go as far as to say that when the Department of Defense dropped its TCP/IP regulations [in the early 1980s], TCP/IP took off like wildfire," Hazelhoff said. "So you could make the case that maybe OSI's going to take off."

Comments

To comment on this or any article, drop us a fax at (508) 820-3467, call (800) 622-1108, Ext. 487, or message us via Internet at network@world.std.com.

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Signature Date

Business Phone Fax

1 Industry: (check one only)

01 ☐ Manufacturers (other)
02. ☐ Finance/Banking
03. ☐ Insurance/Real Estate/Legal
04. ☐ Healthcare Services
05. ☐ Hospitality
06. ☐ Retail/Wholesale Trade/Business Services
07. ☐ Transportation
08. ☐ Utilities
09 ☐ Education
10. ☐ Process Industries (Mining/Construction/ Petroleum Refining/Agriculture/Forestry)
11. ☐ Government (Federal/State/Local)
12. ☐ Military
13. ☐ Aerospace
14. ☐ Consultants (Independent)
15. ☐ Carriers/Interconnects
16. ☐ Manufacturers (Computer/Communications)
17. ☐ VAR/VAD/VAN/Systems Houses/ Software Houses
18. ☐ Distributors,Communications/Computers
19. ☐ Other_____

2 What is your Job Function? (check one only)

NETWORK IS Management:
1. ☐ Networking Management
2. ☐ LAN Management
3. ☐ Datacom/Telecom Management
4. ☐ IS,IT,MIS,Systems Management
5. ☐ Engineering Management

CORPORATE MANAGEMENT:
6. ☐ Corporate Management (CIO,CEO,PRES,VP, DIR,MGR,Financial Management)
7. ☐ Consultant (Independent)
8. ☐ Other_____

3 What is the total number of sites for which you have purchase influence? (check one only)

1. ☐ 100+
2. ☐ 50 - 99
3. ☐ 20 - 49
4. ☐ 10 - 19
5. ☐ 2 - 9
6. ☐ 1
7. ☐ None

4 What is your scope and involvement in purchasing decisions for network products & services for your enterprise?

A. SCOPE (check one only)

1 ☐ Corporatewide
2. ☐ Multienterprise
3. ☐ Departmental
4. ☐ None

B. INVOLVEMENT (check all that apply)

1. ☐ Recommend/Specify
2. ☐ Approve
3. ☐ Evaluate
4 ☐ Determine the need
5. ☐ None

5 Check ALL that apply in columns A and B:

A: I am involved in the purchase of the following products/services.

B: I plan to purchese the following products/services.

A		B LOCAL AREA NETWORKS
☐	01.	☐ Local Area Networks
☐	02.	☐ LAN Operating Systems Software
☐	03.	☐ LAN Services
☐	04.	☐ LAN Storage Devices (optical,tape,disk,etc.)
☐	05	☐ LAN Backup systems (optical,tape,disk,etc.)
☐	06	☐ Network Test Equipment
☐	07	☐ Intelligent Hubs
☐	08	☐ Cables, Connectors, Baluns
☐	09	☐ UPS
☐	10	☐ Network Adapter boards
☐	11	☐ Peer-to-Peer LANs
☐	12	☐ Wireless Networks
☐	13	☐ SNMP Network Management
☐	14	☐ ATM (Asynchronous Transfer Mode)
☐	15.	☐ Remote Access LANs

A		B NETWORK SERVERS
☐	16	☐ LAN Servers
☐	17	☐ File Servers/Applications Servers
☐	18.	☐ Print Servers
☐	19	☐ Communications Servers/Fax Servers
☐	20.	☐ Data Base Servers (Oracle, Sybase, etc.)
☐	21	☐ Superservers
☐	22	☐ Terminal Servers
☐	23.	☐ Remote Access Servers

Involved A	Plan to Purchase B	INTERNETWORKING
☐	☐	24. Bridges
☐	☐	25. Routers
☐	☐	26. Gateways
☐	☐	27. Bridge/Routers
☐	☐	28. Intelligent Hubs
☐	☐	29. Communications Servers

A	B	COMPUTERS/PERIPHERALS
☐	☐	30. Micros/PCs
☐	☐	31. Minis
☐	☐	32. Mainframes
☐	☐	33. Pen-Based
☐	☐	34. Laptops
☐	☐	35. Workstations
☐	☐	36. Image Processing Workstations
☐	☐	37. Front-End Processors
☐	☐	38. Terminals
☐	☐	39. Printers
☐	☐	40. Cluster Controllers
☐	☐	41. Fax Machines
☐	☐	42. X-Terminals

A	B	SOFTWARE/APPLICATIONS
☐	☐	43. Network Management
☐	☐	44. Micro to Mainframe
☐	☐	45. Security
☐	☐	46. Communication/Terminal Emulation
☐	☐	47 Word Processing
☐	☐	48. Operating Systems
☐	☐	49. Business Applications (Finance/Mfg/HR/etc.)
☐	☐	50. Applications Development
☐	☐	51. Data Base Management
☐	☐	52. Spreadsheet
☐	☐	53. Groupware
☐	☐	54. EDI
☐	☐	55. E-Mail
☐	☐	56. Windows/Graphical User Interface
☐	☐	57. 4GL Development
☐	☐	58. Multimedia
☐	☐	59. Graphics
☐	☐	60. Remote Access

A	B	WIDE AREA NETWORKS
☐	☐	61. Modems (9.6K bps and over)
☐	☐	62. Modems (under 9.6K bps)
☐	☐	63. T-1
☐	☐	64. T-3
☐	☐	65. Fractional T-1
☐	☐	66. Data Switches
☐	☐	67. SMDS
☐	☐	68. ATM (Asynchronous Transfer Mode)
☐	☐	69. Matrix Switches
☐	☐	70. Packet Switches
☐	☐	71 Protocol Converters
☐	☐	72. Diagnostic/Test Equipment
☐	☐	73. DSU/CSU
☐	☐	74. Microwave
☐	☐	75. Fax Boards/Modems
☐	☐	76. VSAT
☐	☐	77. Fiber Optic
☐	☐	78. Satellite
☐	☐	79. ISDN
☐	☐	80. PBXs (over 1000 lines)
☐	☐	81. PBXs (under 1000 lines)
☐	☐	82. Automatic Call Distributors
☐	☐	83. Voice Messaging Systems
☐	☐	84. Videoconferencing/Teleconferencing Systems
☐	☐	85. Voice Response/Processing
☐	☐	86. Dedicated Leased Line
☐	☐	87. Switched Data
☐	☐	88. Centrex
☐	☐	89. E-Mail/Online Services
☐	☐	90. Image Processing
☐	☐	91. Local Services
☐	☐	92. WATS/MTs
☐	☐	93. International
☐	☐	94 Virtual Networks
☐	☐	95. Frame Relay
☐	☐	96. Value Added Services
☐	☐	XX. None of the above(1-96)

6 What is the total number of A: LANs B: Workstations/Nodes in your organization?

	A: LANs	B: Workstations/Nodes
1	☐	5,000+ ☐
2.	☐	1,000 - 4,999 ☐
3.	☐	100 - 999 ☐
4.	☐	50 - 99 ☐
5.	☐	10 - 49 ☐
6.	☐	9 or less ☐

7 Which of the following network platforms are currently installed/planned? (check all that apply)

NETWORK ARCHITECTURES

Installed A	Planned B	
☐	☐	01 SNA
☐	☐	02. DECNET
☐	☐	03. MAP/TOP
☐	☐	04. TCP/IP
☐	☐	05. DCA (Unisys)
☐	☐	06. X.25
☐	☐	07. Novell IPX/SPX
☐	☐	08. APPC/APPN/LU6.2
☐	☐	09. NETBIOS
☐	☐	10. OSI

Installed A	Planned B	
☐	☐	11. APPLETALK
☐	☐	12. OTHER_____

LAN OPERATING SYSTEM

☐	☐	13. LOCALTALK (APPLETALK)
☐	☐	14. BANYAN (VINES)
☐	☐	15. DCA (IRMALAN)
☐	☐	16. DCA (10-NET)
☐	☐	17. IBM (LAN SERVER)
☐	☐	18. IBM (PC LAN PROGRAM)
☐	☐	19. MICROSOFT (LAN MANAGER)
☐	☐	20. UNGERMANN-BASS (NET/1)
☐	☐	21. NOVELL (NETWARE,2X,3X,4X)
☐	☐	22. PROTEON (PRONET)
☐	☐	23. SITKA (TOPS)
☐	☐	24. 3COM (3+,3+OPEN)
☐	☐	25. ARTISOFT (LANTASTIC)
☐	☐	26. HAYES (LANSTEP)
☐	☐	27. DEC (PATHWORKS)
☐	☐	28. OTHER_____

LAN ENVIRONMENT

☐	☐	29. 4M TOKEN RING
☐	☐	30. 16M TOKEN RING
☐	☐	31. ARCNET
☐	☐	32. ETHERNET
☐	☐	33. STARLAN
☐	☐	34. FDDI
☐	☐	35. LOCAL TALK
☐	☐	36. 10BASE-T
☐	☐	37. OTHER_____

OPERATING SYSTEM

☐	☐	38. DOS
☐	☐	39. UNIX/XENIX/AIX
☐	☐	40. OS/2
☐	☐	41. OS/2 2.X
☐	☐	42. MVS
☐	☐	43. VM
☐	☐	44. VMS
☐	☐	45. MACINTOSH
☐	☐	46. WINDOWS
☐	☐	47. WINDOWS NT
☐	☐	48. X WINDOWS
☐	☐	49. SOLARIS
☐	☐	50. OTHER_____

8 For which areas outside of the U.S. do you have purchase influence? (check all that apply)

1. ☐ Europe
2. ☐ Asia
3. ☐ South America
4 ☐ Australia
5. ☐ Middle East
6. ☐ None

9 Which of the following hardware platforms are installed/planned in your company? (check all that apply)

	Mainframes Installed	Mainframes Planned	Minis Installed	Minis Planned
01. IBM	☐	☐	☐	☐
02. DEC	☐	☐	☐	☐
03. AMDAHL	☐	☐	☐	☐
04. AT&T	☐	☐	☐	☐
05. BULL HNIS	☐	☐	☐	☐
06. DATA GENERAL	☐	☐	☐	☐
07. HP	☐	☐	☐	☐
08. TANDEM	☐	☐	☐	☐
09. UNISYS	☐	☐	☐	☐
10. OTHER _____	☐	☐	☐	☐

MICROCOMPUTERS (fill in the numbers)

	INSTALLED	PLANNED
11. Macintosh 20,30,40		
12. Macintosh other		
13. PCs based on Pentium		
14. PCs based on 80486		
15. PCs based on 80386		
16. PCs based on 80286		
17. PCs based on 8086/8088		
18. RISC/Unix based wkstns		
19. Other		

10 What is the estimated value of networking equipment and services that you help specify, recommend or approve annually? (check one only)

1. ☐ $100 million and over
2. ☐ $50 - $99.9 million
3 ☐ $25 - $49 9 million
4 ☐ $20 - $24.9 million
5. ☐ $10 - $19.9 million
6. ☐ $5 - $9.9 million
7. ☐ $1 - $4.9 million
8. ☐ $500,000 - $999,999
9. ☐ $499,999 or less

11 Estimated gross annual revenues of your entire company/institution: (check one only)

1 ☐ Over $10 billion
2. ☐ 1 to $9.9 billion
3. ☐ $500 to $999 9 million
4. ☐ $100 to $499.9 million
5. ☐ $50 to $99.9 million
6. ☐ $10 to $49.9 million
7. ☐ $5 to $9 9 million
8. ☐ $4 9 million or less

12 Estimated number of employees for your entire corporation: (check one only)

1 ☐ Over 10,000
2. ☐ 5,000 - 9,999
3. ☐ 2,500 - 4,999
4 ☐ 1,000 - 2,499
5. ☐ 500 - 999
6. ☐ 499 or less

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INTERNETWORKING

Cisco dumps one remote access router line for another

BY SKIP MacASKILL

Menlo Park, Calif.

Just six months after rolling out its first remote office router, Cisco Systems, Inc. last week announced a new line of routers with flexible configuration options that is designed to replace the earlier product.

Cisco's new Model 2500 routers will give remote sites and branch offices access to corporate resources by feeding into higher end routers scattered across an enterprise network. For the first time, Cisco will offer routers with unbundled hardware and software, making them highly customizable.

The new line will make short work of Cisco's Model 2000 routers, announced in June. The company will support all installed Model 2000 units until July 1997 and will provide Model 2000 users with an upgrade path to its 3000 router, which is geared to small branch office sites.

"Because the remote access market was growing so rapidly, Cisco wanted to get to market quickly with a product — so it rushed the 2000 out the door in order to have an offering at the low end," said an industry analyst who requested anonymity. "The 2500 represents the router [Cisco] really wanted to roll out for the remote access market in the first place."

The new line features four models, all of which support a single local-area network interface and multiple wide-area network interfaces.

The 2501 offers an Ethernet interface, two synchronous serial ports and a single asynchronous serial connection. The 2503 offers all that as well as a port that supports an Integrated Services Digital Network Basic Rate Interface connection. The 2502 and 2504 provide the same configurations as the 2501 and 2503, respectively, but support token-ring connections rather than Ethernet.

"The 2500 represents the router [Cisco] really wanted to roll out for the remote access market in the first place."

All four models come with flash erasable programmable read-only memory, and by midyear, the serial ports on the new platform will be configured to operate in synchronous or asynchronous mode.

Cisco will give Model 2500 users a choice of software three packages — IP Router, Desktop and Enterprise — that provide a variety of routing, bridging and WAN options.

The IP Router package offers support for the Internet Protocol as well as the Routing Information Protocol and Open Shortest Path First routing protocols. WAN protocols supported include the Point-to-Point Protocol, X.25, frame relay and High-Level Data Link Control. The IP Router also offers a full suite of management capabilities, including support for the Simple Network Management Protocol, IBM's LAN Network Manager and Cisco's AutoInstall utility.

Additionally, the package includes many of Cisco's Systems Network Architecture functionality, such as Remote Source Route Bridging, Proxy Explorer, local acknowledgments, local logical unit address prioritization, and Network Basic I/O System name caching and access control filtering.

The Desktop option includes all the IP Router features, plus support for Novell, Inc.'s Internetwork Packet Exchange (IPX), Digital Equipment Corp.'s DECnet IV and Apple Computer, Inc.'s AppleTalk Phase 1 and 2 LAN protocols.

The Enterprise kit for the Model 2500 includes support for Cisco's entire protocol suite and all of its feature sets.

According to John DePietro, WAN analyst at International Data Corp., a market research firm in Framingham, Mass., the rollout of the 2500 comes as no surprise. "To compete in the remote access market, ven-

See Cisco, *page 13*

HP introduces new class of low-end Unix servers

Set to give Pentium systems a run for the money.

BY CHRISTINE BURNS

Palo Alto, Calif.

Hewlett-Packard Co. last week rolled out three new Unix servers positioned as low-end counterparts to its HP 9000 family of RISC-based enterprise servers.

The new HP 9000 E-class servers, Models E25, E35 and E45, offer the power needed to run mission-critical applications at a price comparable to machines based on the traditionally less expensive Intel Corp. Pentium chip, the company said.

"HP has always set a very high entry point for their servers in terms of both power and price," said Wayne Eckerson, senior consultant at the Boston-based consultancy Patricia Seybold Group. "Other companies have already shipped lower end Unix machines, like Sun, and with the Pentium machines putting the squeeze on that same market space, it became important for HP to have something to offer there, too."

The HP-9000 E-class servers are built on HP's high-performance Precision Architecture-Reduced Instruction Set Computing (PA-RISC) chip that HP introduced last December. Lew Platt, chairman and chief executive officer of HP, claimed that in-house testing showed the Model E35 offered has up to 73% more computing power than similarly priced Pentium-based servers.

Compaq Computer Corp., Dell Computer Corp. and Unisys Corp. have all delivered high-end local-area network servers based on the Pentium processor this year. Prices for those machines range from $5,550 for Dell's 60-MHz 4560/XE server to $17,999 for Compaq's 66-MHz SystemPro/XL 5/66 model. The new HP servers range in price from $5,969 to $11,319.

HP delivers high-performance, low-cost Unix servers

Server	On-line transaction processing speed	Price	Availability
Model E25	80 transaction/sec	$5,969	Now
Model E35	125 transaction/sec	$8,319	Now
Model E45	155 transaction/sec	$11,319	May

HP's new servers are positioned as the low-end members of its HP 9000 family of Precision Architecture-Reduced Instruction Set Computing-based enterprise servers.

SOURCE: HEWLETT-PACKARD CO., PALO ALTO, CALIF.
GRAPHIC BY TERRI MITCHELL

In terms of operating system software available to run on either type of machine, Eckerson pointed out that the Pentium machines support a variety whereas the RISC-based machines tend to only support their own proprietary version of Unix."

The HP servers support the latest version of HP's flavor of Unix, HP-UX 9.04, but company officials said they will explore the possibility of supporting Microsoft Corp.'s Windows NT if sales of warrant it.

While HP contends that there are more than 5,000 business-critical applications that can run on HP-UX, Marty Palka, an analyst with Dataquest, Inc., in San Jose, Calif., said there are fewer business applications for RISC-based machines. However, HP last year announced a partnership with Novell, Inc. in which the two will port native NetWare to the PA-RISC platform, therefore allowing all applications supported by NetWare to run on HP PA-RISC servers.

Carol Mills, general manager of HP's General Systems Division, said one of the strengths of the HP 9000 E-class servers is they can be managed via HP's network management system, HP Openview, which many users already employ.

"These are the types of servers that can run replicated applications in dozens to thousands of branch offices in big companies because first of all, you can afford to put them in all those sites, and secondly, because you can trust that they have enough power to do the job," Mills said.

The base hardware configuration of the servers include two I/O slots expandable to four slots, 16M bytes of random-access memory, 535M bytes of disk space, eight RS-232 ports, an integrated 802.3 Ethernet interface and integrated Small Computer System Interface-2 support.

The servers are also shipped with preloaded software that eases setup and configuration, support for an uninterruptible power supply to ensure server uptime and remote console support that allows the server to be controlled remotely, an important consideration for enterprise net users.

While Models E25 and E35 are available now, the Model E45 will not ship until May.

✆HP: (800) 752-0900.

Cincom to ease client/server migration

BY ROSEMARY CAFASSO

Cincinnati

Cincom Systems, Inc. this week will continue its push into the distributed computing market with a turnkey server and software package, as well as a service for migrating users from legacy to client/server networks.

The company will roll out its Diamond DataPaks, soup-to-nuts client/server systems consisting of third-party hardware and software, as well as Cincom gateway and development tool software. Under Cincom's new migration service, Fastforward for VSAM, the database company will transfer users' host-based Cobol code to SQL-based platforms.

In both cases, Cincom will try to make moving to client/server less daunting for customers by doing the bulk of the work for them. Like many of the old-line mainframe software companies, Cincom has an ongoing effort to break out of the host-only mode.

Cincom's pricing of its client/server offerings will no doubt be a draw. Company officials said the Cincom software bundled into the Diamond Datapaks will sell for 50% less than the list price.

"In the short run, this approach is valid," said Ed Acly, director of software research for International Data Corp. in Framingham, Mass. The client/server market is confusing to many users and one option for vendors is "to make it more simple for them," he said.

Initially, Cincom will provide three hardware configurations with the Diamond Datapaks, including Hewlett-Packard Co., Data General Corp. and IBM systems servers, said David Bunker, senior director of marketing and business planning. The systems will come bundled with third-party server and client operating system software, as well as Cincom products that include application development tools, a gateway to link legacy and client/server platforms, and a mainframe software component to retrieve host data for the new platform.

Altogether, Cincom will offer 40 versions of its Diamond Datapak, each with different server, client and application development software combinations. A sample configuration with IBM MVS software, a Data General server, Windows client software, and a gateway and select tools from Cincom would sell for $67,520. The total list price of those components, Bunker said, would be more than $180,000.

Angelica Corp., a maker of uniforms and career apparel in St. Louis, recently licensed a Diamond Datapak to assist it in moving application development off the mainframe and for future development of client/server applications.

"This capability will allow us to still work with the mainframe," said Kenneth Aull, director of information systems at Angelica. "[Cincom] is trying to cut through the complexities of client/server and make the initial cutover for users a little easier."

Cincom's other offering, Fastforward for VSAM, calls for the vendor to translate customer code from IBM's VSAM flat file platform to an SQL-based database system, preferably Cincom's own Supra.

Boston Weatherhead, a division of Dana Corp. in Brentwood, Tenn., has been working with Cincom on a Fastforward for VSAM project since last year. The project involves transferring a batch-based accounts payable application to Supra running on a mainframe.

Rich Krejsa, manager of technical services at Boston Weatherhead, said about 85% of the corporate data is currently in VSAM files.

Fastforward for VSAM services come with a fixed price, ranging from $50,000 to $100,000.

✆Cincom: (513) 662-2300.

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NETWORK MANAGEMENT

NetTech extends view of its mgmt. tools beyond SNA

BY MICHAEL COONEY

Raleigh, N.C.

NetTech, Inc. this week will announce software that gives its SNA management products a more complete view of all devices in an enterprise net.

The firm's new proxy agent software will let its EView family of Systems Network Architecture net management tools monitor and control legacy equipment, such as older modems and multiplexers, that cannot be managed by most of today's SNA or Simple Network Management Protocol enterprise management systems.

EView tools gather SNA management data from IBM's host-based NetView and feed it to SNMP managers, such as IBM's NetView/6000 or Hewlett-Packard Co.'s OpenView, giving users a consolidated view of both SNA and multivendor net resources.

The proxy agent, built by Bridgeway, Inc. of Seattle, lets older devices pass status, alarm and configuration information to EView via the device's ASCII port. EView can also send commands, such as for restarting a failed device.

Maxm Systems Corp. and Boole & Babbage, Inc. both have management products that perform similar functions, but both gather data via an ASCII port on element management systems, not the device itself.

Atul Kapoor, a principal at Kaptronix, Inc., a Haworth, N.J., consultancy, said that is a sound strategy. "There is a huge installed base of non-SNMP devices out there, from vendors such as [Motorola] Codex, Ascom Timeplex [Inc.] and others, with no way of being managed — or at best, they are managed by an old proprietary manager," he said.

According to Stan Fiedor, manager of data communications at the Medical Center of Delaware in Newark, Del., "Any tools that would let us see more of our network equipment would be a benefit. In a large environment like ours, getting alerts from all of our equipment would let us resolve problems much quicker."

EView, with the new proxy agent, resides for the most part on the SNMP manager. A piece of EView code on the mainframe gathers net management data from NetView, along with SNA device data from VTAM, and passes it over an LU 6.2 session to the central EView application on the SNMP manager. The proxy agent will add non-SNMP devices to that mix.

The data is stored in the SNMP manager's database. EView then correlates the information and sends it to the management console, providing a real-time, integrated view of the enterprise.

EView includes interfaces into Information/Manager, NetView's problem, change and configuration management database, which helps users keep track of problems detected by EView. It also supports automation scripts, enabling users to write commands that EView could automatically kick off in the event of a predefined problem.

Available now, the EView platform sells for $23,000.

✆NetTech: (919) 781-7887.

Cisco

Continued from page 10

dors need to provide a single-board router with standard connectors and low entry points," he said. "It was a logical move for Cisco to devise the 2500 to meet that criteria. It will allow them to be price-competitive with 3Com [Corp.], which rolled out its Remote Office Router earlier this month."

The 2500 hardware platforms are available now and cost from $995 to $2,195, depending on interfaces supported. The IP Router, Desktop and Enterprise software packages cost $1,500, $2,300 and $3,000, respectively. They are also available now.

In conjunction with the 2500 rollout, Cisco also announced a series of enhancements for its Cisco 4000 router, which is designed for large branch sites or regional offices.

Among the features are a new dual-port IBM Token-Ring module that provides connections for two Token-Ring LANs running at either 4M or 16M bit/sec. A single-mode, dual-attached station Fiber Distributed Data Interface module was also added to the line, complementing support for a multimode model.

A new four-port serial module, which doubles the density of the existing two-port version, was also unveiled.

All three modules are available now. The Token-Ring version costs $4,600, the FDDI module is tagged at $9,000, and the new serial module costs $4,600.

✆Cisco: (415) 326-1941.

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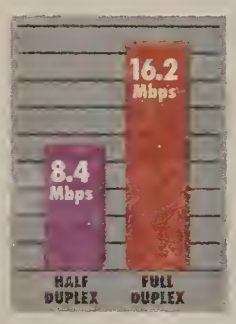

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Circle Reader Service #6

IBM unveils long-awaited APPN 3270 support along with net tuning products

BY MICHAEL COONEY

Raleigh, N.C.

As expected, IBM last week rolled out products designed to help SNA users support 3270 devices in APPN nets, more easily tune their networks for peak performance and support multivendor traffic on the mainframe.

Making most of these capabilities possible is a new release of the mainframe's communications traffic cop — VTAM 4.2. VTAM 4.2 includes the much-heralded arrival of dependent LU Requestor/Server (dLUR/dLUS) software, which, in conjunction with dLUR on the 3174 controller, brings 3270 devices fully into the Advanced Peer-to-Peer Networking (APPN) fold (*NW*, Jan. 17, page 7).

In addition, IBM announced a new low-end 3745 front-end processor (FEP) and AnyNet for VTAM, software that lets the mainframe more fully participate in multivendor networks. And new programs for the FEP's operating system, Network Control Program (NCP) will now let users tune their Systems Network Architecture nets on the fly.

DLUR/dLUS is considered crucial to the ultimate success of APPN.

"Being able to support 3270 devices fully in an APPN network is what most SNA users have been waiting for to plan their migration to APPN," said Robin Layland, a principal consultant with Layland Consulting in West Hartford, Conn. "How fast IBM gets this technology out the door will be key."

According to Rick McGee, director of IBM's networking systems architecture, it won't be long. "The products are in place, and we expect 1994 to be the year of installation."

DLUR is client software that will ultimately reside on a variety of traditional IBM and non-IBM equipment. Last week though, IBM announced dLUR only for the 3174.

It lets 3270 data travel on an LU 6.2 session over an APPN net to an SNA mainframe, where dLUS, which resides on VTAM, directs the 3270 traffic to its destination. Together the components will enable 3270 users to freely access multiple APPN net hosts and resources.

"The 3270 traffic will now be able to utilize APPN's dynamic routing capabilities and will no longer be required to go through VTAM or an attached NCP," said Gary Burnette, manager of IBM's VTAM strategy.

VTAM 4.2 will also include the Multiple Network Connectivity (MNC) feature, known as border node support, that will let users join APPN nets together to form one large net. Alternatively, it allows users to subdivide APPN nets into smaller, more manageable subnetworks.

"We considered VTAM 4.1 to be one release away from full APPN implementation in our network because of its lack of 3270 [support] and its inability to support multiple interconnected APPN nets," said Jim Zatloukal, manager of network software development for Advantis. Advantis is the value-added network service provider owned by IBM and Sears, Roebuck and Co.

To expand the mainframe's role in multivendor networking, IBM also brought AnyNet support to VTAM 4.2. AnyNet is the implementation of IBM's Multiprotocol Transport Networking code that makes applications independent of underlying network transport protocols. IBM already supports AnyNet in its OS/2 and MVS systems.

See **IBM**, *page 25*

IBM rolls out the goods

Product	Price	Availability
VTAM Version 4 Release 2	Not yet available	Expected by midyear
3174 dependent LU Requestor software	No charge	June 24
NTuneMON	$275 per month	March 25
NTuneNCP	$125 to $570	March 25
3745 Model 17A	$28,950	Feb. 18
Upgrade from 3745 Model 170	$8,000	

GRAPHIC BY TERRI MITCHELL SOURCE: IBM, WHITE PLAINS, N.Y.

BRIEFS

AT&T Paradyne has brought out a **data service unit/channel service unit** (DSU/CSU) that includes an integral **modem** for performing remote diagnostics and software upgrades.

The new Acculink 3160 and 3164 T-1 and fractional T-1 DSU/CSUs ensure dial access to remote sites even if T-1 lines fail. The dial-up line can also be used for software downloads, such as the Simple Network Management Protocol agent support the DSU/CSUs will include in April.

The 3160 features two synchronous ports, while the 3164 sports four synchronous ports. Both also include a DSX-1 port for connections to digital private branch exchanges and T-1 multiplexers.

Prices for both units start at $2,995. They are available now.

AT&T Paradyne: (800) 482-3333.

IBM last week announced a new version of its **6611 router** software that adds improved 6611 performance, and adds support for Advanced Peer-to-Peer Networking (APPN) Network Node (NN) and Banyan Systems, Inc.'s VINES. APPN NN support means the router will be able to route APPN traffic natively over an APPN net.

Multiprotocol Network Program (MNP) Version 2 promises a 70% improvement in response times for **Data Link Switching** (DLSw) users. DLSw lets Systems Network Architecture and Network Basic I/O System traffic traverse a net running Transmission Control Protocol/Internet Protocol. With the new software, the 6611 can also process Ethernet or Token-Ring packets 40% to 60% faster than the previous software release.

MNP Version 2 will be available March 25 ranging from $1,500 to $6,300, depending on processor size. Existing users can upgrade for free.

Firms offer backbone feeder wares

Hypercom box integrates SNA, LAN and voice traffic.

BY MICHAEL COONEY

Phoenix

Hypercom, Inc. last week announced its Router Plus, a box capable of consolidating Systems Network Architecture, local-area network and voice traffic onto T-1 lines.

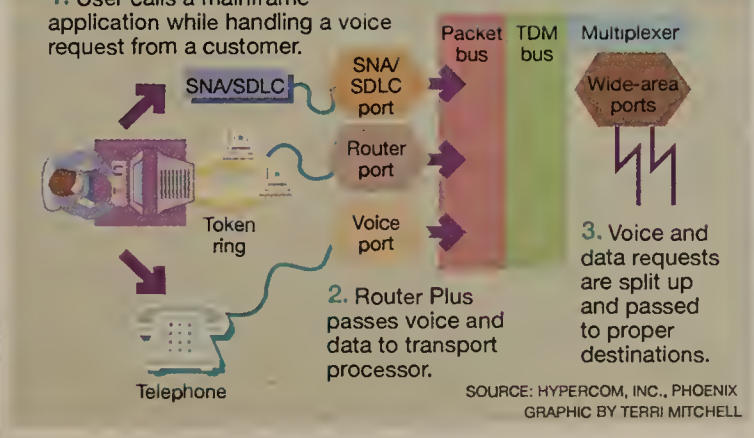
The Router Plus is a multifaceted box that comprises a router, multiplexer, protocol converter, data service unit/channel service unit (DSU/CSU) and dial backup modem in one user-customizable unit. It uses a combination of packet switching and time-division multiplexing (TDM) to handle everything from SNA to LAN traffic.

The unit builds on the firm's existing Integrated Enterprise Network (IEN) family by adding support for T-1 lines and voice transmissions. IEN products include a variety of models that can be configured to support routing, bridging, frame relay and Synchronous Data Link Control-to-Logical Link Control-2 protocol conversion.

"The Router Plus gives users a single device where they can consolidate all network traffic — SNA, LAN and voice from a PBX — onto multiple T-1s," said Paul Wickre, director of sales and marketing at Hypercom. "By consolidating their voice and data traffic,

See **Hypercom**, *page 25*

Router Plus gets it all together



SOURCE: HYPERCOM, INC., PHOENIX
GRAPHIC BY TERRI MITCHELL

Cascade adds lower speed, lower cost access to WAN switch.

Cascade Communications Corp. has announced three new modules for its STDX wide-area switches that promise to help users consolidate low-speed WAN links and provide less expensive access to high-speed switched services such as frame relay, SMDS and ATM.

Two modules support Integrated Services Digital Network access and additional low-speed access lines for all of the STDX models, while the third offers expanded T-1 support for the high-end STDX box.

Cascade's ISDN Primary Rate Interface (PRI) Module includes a four-port board and software. It supports up to 23 64K bit/sec ISDN calls per card and fits in the company's STDX Models 3000, 6000 and 9000.

Fully populated, the low-end STDX 3000 could support two ISDN PRI Modules, while the STDX 6000 supports five, and the STDX 9000 holds 14 modules supporting up to 1,288 ISDN connections.

Desh Deshpande, executive vice president of Cascade, said the ISDN module is designed to offer a low-cost alternative to leased lines for remote branch office users. "In many areas of the country, a 64K bit/sec ISDN circuit costs as little as $30 to $35 per month compared to $250 for a 56K bit/sec dedicated line," Deshpande said. "Where users need expensive individual leased lines to remote sites now, they can set up a Cascade switch to support a single ISDN link that can support multiple sites less expensively."

Cascade also announced a Universal I/O Module designed to feed multiple low-speed lines to high-speed backbones. The Universal Module fits in the STDX 3000 and 6000 and can be configured to support eight or 18 ports at speeds ranging from 2,400 to 128K bit/sec.

"Users can aggregate their low-speed SNA or LAN traffic onto a local frame relay service or T-1 backbone and [send it] on to a mainframe," Deshpande said.

Lastly, the company added a 10-port version of its DSX-1 Module, which aggregates as many as 10 T-1 or fractional T-1 lines and feeds them to a central office switch. The DSX-1 only fits in the high-end STDX 9000 model, which is generally targeted for carrier usage. A

See **Cascade**, *page 25*

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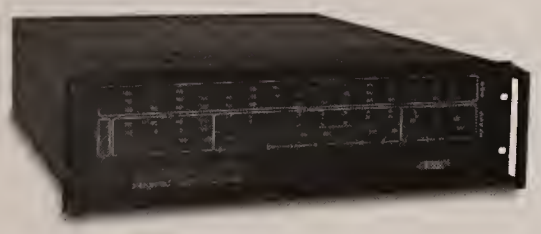

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Company

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City State Zip

Telephone ( )

Protocols in use:

❒ SNA
❒ Bisynch
❒ Novell SPX/IPX
❒ Other _____
❒ Asynch
❒ X.25
❒ TCP/IP
❒ NetBIOS

LAN topologies installed?

❒ Token Ring
❒ Ethernet ❒ Other _____

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by Scott Bradner

Not just GOSIP anymore

The U.S. Federal Internetworking Requirements Panel (FIRP) has issued a draft of its reevaluation of the U.S. government's requirements for open systems networks and recommended policy on the government's use of networking standards. I expect that by the time this column appears there will have been a number of news stories about the draft and its recommendations. Since it refers to some issues that I've written about in these columns in the past, I'd like to make some more comments now.

This panel was convened to examine the disconcerting fact (to some) that U.S. government use of network protocols other than OSI, most notably TCP/IP, continued to expand even though the government in 1988 defined a subset of the OSI networking standards, known as GOSIP, as the official network protocols for all governmental use — sort of like the official toothpaste for the Olympic games, but in this case the payment is reversed.

In a previous column (*NW*, May 31, 1993, page 21), I lamented that as far as higher level corporate management — and by implication, governmental management (if management is a legitimate word in this context) was concerned — the IETF standards could garner little respect. This is in spite of the careful standards development process that I described in a subsequent column (*NW*, July 5, page 13).

There are many positive things in this 40-page draft from the FIRP, but one of the most satisfying to me as an Internet Engineering Task Force (IETF) attendee, an Internet Engineering Steering Group (IESG) member, an Internet Society member and an Internet Society trustee is the recommendation that "for the U.S. federal government, IETF standards should qualify as 'open, international, voluntary standards' and should qualify for use on an equal basis with standards from internationally recognized standards organizations."

The board has determined that the IETF standards process and the resulting standards are legitimate and not the equivalent of a slightly off-color joke. This draft suggests that it is better to strive for effective and cost-efficient solutions to problems rather than to blindly follow the Holy Grail of any particular set of standards.

If these recommendations are adopted then TCP/IP and OSI products will be not only competing amongst themselves but also with Internet Packet Exchange (IPX), SNA and AppleTalk to best meet the needs of the particular governmental organization.

This applies only to the U.S. government and only if the draft is not modified during the comment period. It does not mandate any changes in U.S. industry but, just maybe, the action will be noted in some of the higher management layers. The people on the lower levels, who have had the job of actually getting things to work, have been voting with their designs for quite a while.

This also only applies within the U.S. There are many other governments across the globe that have established GOSIP-like requirements of their own. This U.S. document might be used as an example of the kind of change that is best for the networking community.

The text of the draft report is available via anonymous ftp from the prophetically named computer "osi.ncsl.nist.gov." Comments on the draft can be sent to the E-mail address "firp-comments@osi.ncsl.nist.gov." It is also real nice to see that they prefer comments in electronic form instead of on paper.

Sign seen in the window of a local restaurant: "All new breakfast — $2.99" — I don't want to know what the alternative is.

Disclaimer: Opinions? Harvard does not have opinions; it has dictates, and these ain't them.

Bradner is a consultant with Harvard University's Office of Information Technology. He can be reached via the Internet at sob@harvard.edu.

Comments

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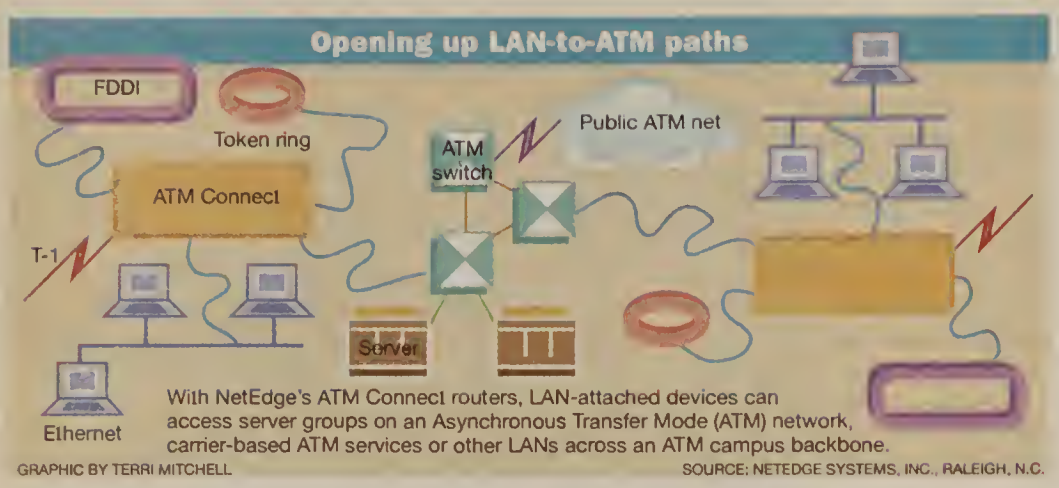

Router provides gradual migration path to ATM

BY SKIP MACASKILL

Raleigh, N.C.

NetEdge Systems, Inc. last week unveiled a router that provides LANs with access to traditional wide-area services as well as public and private Asynchronous Transfer Mode (ATM) networks.

The company's ATM Connect is intended to help users gradually incorporate ATM technology into their enterprise nets by giving traditional local net users access to ATM services without requiring extensive network upgrades.

NetEdge, the FiberCom, Inc. internetworking division that will be spun off as an independent company this week, also announced a partnership with ATM switch vendor Fore Systems, Inc. that includes the sharing of technologies between the two companies.

The four-slot ATM Connect comes with a main engine card that supports four Ethernet network connections via BNC or attachment unit interface ports as well as four serial line connections that support speeds up to T-1/E-1 via RS-422 or V.35 interfaces.

Four expansion slots support a variety of interface modules, including a 12-port 10Base-T model, four-port token ring, two-port Fiber Distributed Data Interface and a two-port ATM module that will initially support speeds of 45M or 155M bit/sec.

The device, which is powered by multiple Reduced Instruction Set Computing-based processors, provides ATM cell segmentation and reassembly functions as well as an internal ATM data service unit/channel service unit.

"...No one is going to make forklift changes to the network today to accommodate ATM."

ATM Connect also offers local Ethernet and token-ring switching capabilities to the desktop and virtual LAN functionality, which allows devices located on Ethernet, token-ring or FDDI nets anywhere in the enterprise to participate in a software-defined work group. This feature allows a net manager to place work group servers on high-performance ATM networks and give users on lower speed LANs more efficient access to those resources.

ATM Connect supports permanent virtual circuits as well as Fore's ATM call signaling protocol, which will let traditional LAN workstations communicate with ATM-based workstations. Future releases will support the ATM Forum's Q.93B standard, which provides for the establishment of switched virtual circuits.

"The product will be attractive to users because no one is going to make forklift changes to their network today to accommodate ATM," said John DePietro, WAN analyst for International Data Corp., a market research firm in Framingham, Mass. "For users it's a question of integrating what they have now into ATM backbones and public networks. ATM Connect gets them there."

Valentin Sribar, senior research analyst at META Group, a consultancy in Westport, Conn., said this market will likely get crowded quickly.

"Users can expect similar offerings from the router vendors, which have the routing down but are generally weak on the ATM side, and the hub companies, which are in the exact opposite situation," he said. "There's time for everyone to fine-tune offerings here because the market won't really take off until 1995."

ATM Connect will be available in February, and will cost between $20,000 and $42,500.

✆NetEdge: (800) 638-3343.

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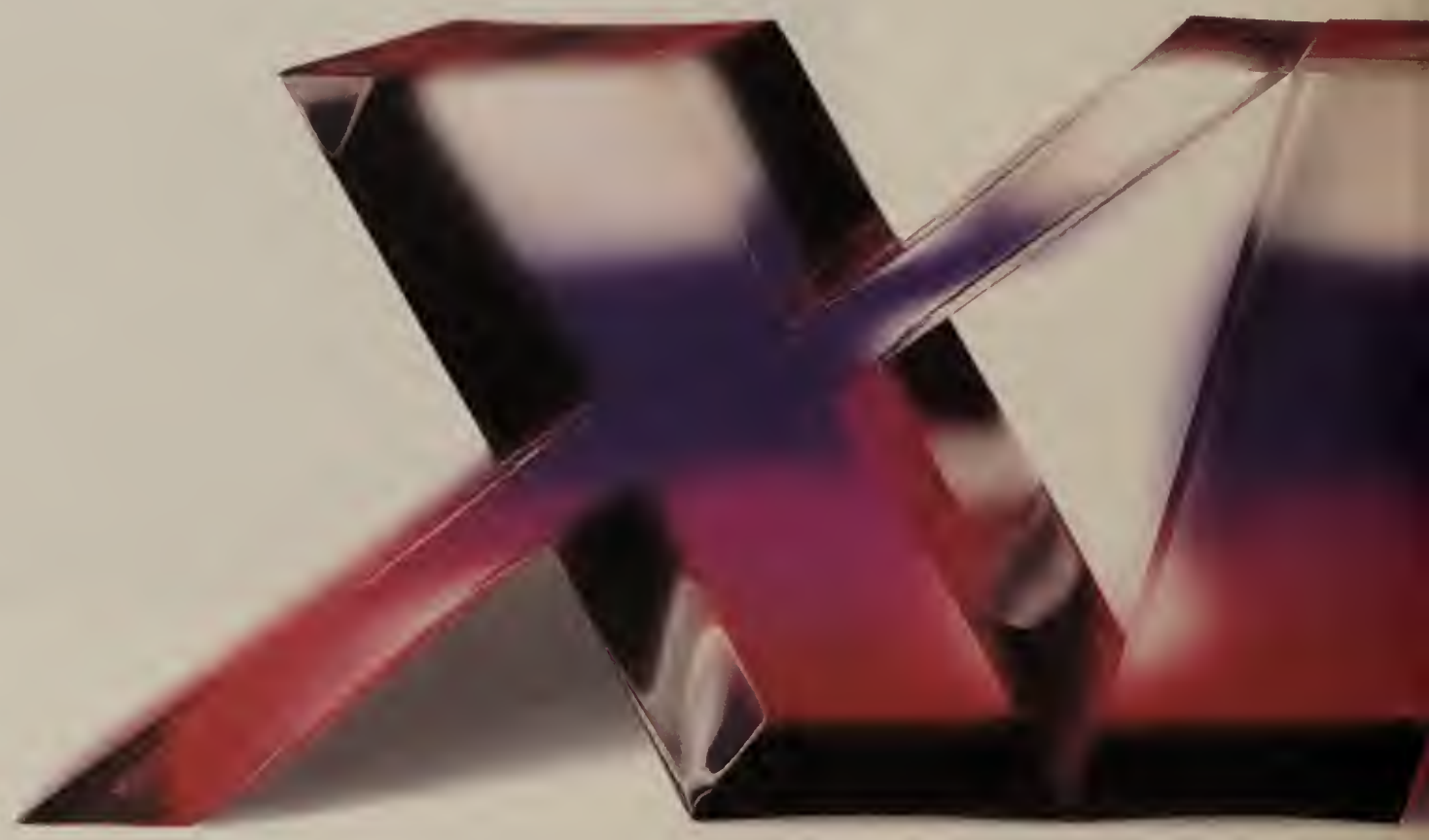

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BRIEFS

Rememory Corp. of Costa Mesa, Calif., has delivered the Remserve Archiving Server Kit, software that will let users build **archiving** servers for **Novell, Inc. NetWare** networks based on installed Intel Corp.-based 80486 personal computers. The new software is a variation on Rememory's turnkey Archiving Server product, a hardware/software network archiving package consisting of a 486-based PC preloaded with NetWare and Rememory's archiving software. Rememory's offerings are designed to back up all server-based data across an enterprise net by leveraging NetWare Loadable Modules installed on each NetWare 3 or NetWare 4 server.

The new kit comes with an unlimited-user version of the Remserve Software System, a 16-bit Industry Standard Architecture (ISA) or 32-bit Extended ISA (EISA) Small Computer System Interface controller, NetWare 4 and NetWare 3 Target Service Agents, and documentation. Available now, the ISA kit costs $995 and the EISA kit costs $1,395.

Rememory: (800) 644-2300.

Optical Data Systems, Inc. (ODS), a hub vendor in Richardson, Texas, this week will unveil the 1094-Ethernet In FDDI Out (EIFO), a multiport Ethernet-to-**Fiber Distributed Data Interface** bridge module for its Infinity intelligent hub line. The 1094-EIFO, which fills two hub slots, features 12 10Base-T connections and a single FDDI link that can be either single- or dual-attached. The module will let up to 12 Ethernets be interconnected across an FDDI backbone or provide high-speed access to a server group located on an FDDI net. Available now, the 1094-EIFO costs $8,900.

ODS: (214) 234-6400.

Legato Systems, Inc. in Palo Alto, Calif., last week announced the addition of Windows and IBM OS/2 client support to its Networker **local-area network backup** product line. Previously, Legato only offered centrally controlled backup and recovery services from either a Novell, Inc. NetWare or Unix file server. The new client support will let end users back up their own files and will give administrators the ability to schedule networkwide backup processes from OS/2 and Windows personal computers.

The client support is available free of charge for customers running Networker for NetWare or Networker for Unix.

Legato: (415) 812-6000.

Santa Clara, Calif.-based **3Com Corp.** this week at ComNet '94 will roll out a new line of **PCMCIA**-based network interface cards (NIC) for its family of EtherLink III Parallel Tasking adapters. The NICs are designed for notebook PCs, bringing Parallel Tasking capabilities to that platform for the first time. Parallel Tasking accelerates data transfer by letting adapters send a frame onto the net while simultaneously processing the next frame in system memory.

The adapters are available at $225 each for copper-based networks and at $270 each for both copper and coaxial cable connections.

3Com: (408) 764-5000.

ENTERPRISE HUBS

Chipcom bows to user needs with ONcore hub

BY SKIP MACASKILL

Southborough, Mass.

Chipcom Corp. last week unveiled a next-generation hub that can be used as either an enterprise device for migrating shared LANs to new switching environments or as a departmental work group hub.

The ONcore Switching System, jointly developed with IBM, is designed to be flexible enough for users to deploy almost anywhere on a corporate network.

Chipcom built the hub using the same Tri-Channel Architecture of its ONline System Concentrator, a strategy that will enable the ONcore hub to accommodate modules originally made for ONline. At the same time, ONcore leaps into the future of networking.

"ONcore supports every network switching technology available and can be used as a network center box that ties the enterprise into the [Asynchronous Transfer Mode] world," said Gordon Saussy, director of product management at Chipcom.

ONcore, which was previewed at INTEROP 93 Europe last fall (*NW,* Nov. 1, 1993, page 1), is a 17-slot hub that doubles the capacity of the ONline hub. ONcore supports eight Ethernet, 17 token-ring and eight Fiber Distributed Data Interface networks.

In addition to reworking its Tri-Channel Architecture backplane to support more local-area network segments, Chipcom has added a 1G bit/sec packet switching bus for technologies such as switched Ethernet and an 8G bit/sec cell switching bus based on IBM's Prizma ATM chip. All told, ONcore will offer users in excess of 13G bit/sec of backplane capacity (see graphic, page 32).

The first two modules developed specifically for ONcore will be a 24-port 10Base-T Ethernet module and a 10-port 10Base-FB Ethernet module. Both will include per-port configuration switching capabilities

See **ONcore,** *page 32*

LANNET plans to add ATM, switching to hubs

BY SKIP MACASKILL

Irvine, Calif.

LANNET, Inc. this week will try to shed its image of being just an Ethernet equipment provider when it details plans to add support for Asynchronous Transfer Mode (ATM) and other high-speed technologies to its hubs.

The company said it will leverage the multiprotocol, network switching architecture of its MultiNet hubs to add new technologies for supporting client/server and enterprise applications.

"The [hub] market is being driven by client/server applications and the ability to move large data files quickly around an enterprise," said Michael Howard, president of Infonetics Research, Inc., a consultancy in San Jose, Calif. "LANNET needs to start telling the story about how its technology benefits users in client/server environments."

LANNET plans to do exactly that at this week's ComNet '94 show in Washington, D.C., said Avi Fogel, the company's president.

"Our goal is to provide the necessary tools to build high-performance client/server environments across the enterprise that will allow users to seamlessly exchange information via a host of switching technologies," he said.

Toward that end, LANNET will announce an alliance with General DataComm Industries, Inc. (GDC) under which the companies will develop products integrating Ethernet, ATM and public networks technologies.

The key to LANNET's overall strategy is to build on MultiNet's 1.28G bit/sec cell switching bus. This bus complements the hub's shared media access backplanes, which support multiple Ethernet, token-ring and Fiber Distributed Data Interface networks (see graphic, this page).

Slicing up the backplane

Components of LANNET's MultiNet wiring hub:

- 1 1.28G bit/sec bus supporting up to 128 dedicated Ethernet links
- 4 Ethernet buses together supporting up to 16 Ethernet segments
- 2 token-ring buses together supporting up to 18 token-ring segments
- 4 Apple Computer, Inc. LocalTalk buses together supporting up to 14 LocalTalk networks
- 1 FDDI bus supporting up to 18 FDDI rings
- 2 control buses

GRAPHIC BY TERRI MITCHELL SOURCE: LANNET, INC., IRVINE, CALIF.

LANNET already takes advantage of the hub's cell switching bus by offering an Ethernet switch module, dubbed LANswitch.

As many as 16 of these eight-port modules can reside in the MultiNet, providing 128 ports for dedicated Ethernet links. In the second half of the year, the company said it will deliver switch modules for FDDI as well as

See **LANNET,** *page 32*

NetWare to win battle with NT

BY CARYN GILLOOLY

Cambridge, Mass.

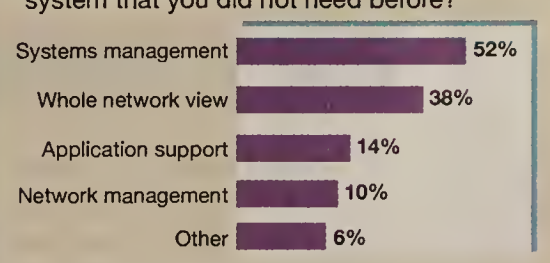
Novell, Inc. may be facing the most serious challenge ever to its dominant position in the local-area network market with the release of Microsoft Corp.'s Windows NT and the pending release of its Cairo, Chicago and Hermes software.

But according to a new study, "Can NetWare Survive NT?," from Forrester Research, Inc., a Cambridge, Mass., market research firm, Novell has little to worry about.

"Most network planners see NT as an application server operating system, not the basis for a companywide network," the study states. "Microsoft's failure with LAN Manager leads users to say that Microsoft has yet to prove itself in networking."

Changing network needs

What do you need from your LAN operating system that you did not need before?



Figures are based on responses from 50 MIS professionals at large corporations. Respondents were allowed to pick more than 1 answer.

SOURCE: FORRESTER RESEARCH, INC., CAMBRIDGE, MASS. GRAPHIC BY TERRI MITCHELL

Paul Callahan, a senior analyst at Forrester, said the struggle between NetWare and Windows NT will center around directory services and system management — two of the fastest growing needs at the largest 1,000 U.S. firms' sites interviewed for the study (see graphic, this page).

Novell has attacked the directory issue with NetWare Directory Services (NDS), while Microsoft has announced Hermes as its solution for system management. "Microsoft will go for Novell's weak midsection with Hermes systems management," Callahan said. He pointed out that while Novell does have its newly announced NetWare Distributed Management Services strategy, the plan is in its early stages.

Microsoft will then try to persuade users to hold off on implementing directory services until Cairo is released with its object-oriented file system, Callahan said. The Cairo file system will form the basis of Microsoft's directory services offerings.

But Novell's NDS is here now. Therefore, Callahan said, Novell will focus on enhancing NDS while trying to get its nascent management product off the ground.

For those customers where management

See **NetWare,** *page 32*

Cascade

Continued from page 16

fully loaded STDX using the DSX-1 module can support 140 T-1 links. Cascade previously offered a four-port T-1 module.

"With these products, we'll be able to offer our users greater and less expensive access to switched services," said Jerry Cady, director of advanced services for Pacnet, Inc., a regional telephone provider in Seattle. Pacnet will be installing the new Cascade products during the next few months.

The products will be important for both carriers and private network users, said Tom Nolle, president of CIMI Corp., a consultancy in Voorhees, N.J. "Providing increased access for the remote offices as well as the corporate users helps cost-justify frame relay and SMDS services."

✆Cascade: (508) 692-2600.

Hypercom

Continued from page 16

some users could see a 50% savings compared to using their existing separate networks."

Router Plus, like other IEN products, contains two buses, a 344M bit/sec packet bus and a TDM bus capable of supporting 126 64K bit/sec time slots. Individual modules have their own processors that support Ethernet, token ring, Transmission Control Protocol/Internet Protocol, SDLC, X.25 and Integrated Services Digital Network interfaces.

The Router Plus can support as many as four T-1, 56K bit/sec frame relay or X.25 connections on the wide-area side. Today, IEN products support a maximum of four 64K bit/sec lines.

Sitting in a branch office, the Router Plus takes data traffic from the LAN and routes it using the Routing Information Protocol or Open Shortest Path First routing protocols onto a T-1 link. SNA traffic is sent through the more static TDM mux and voice traffic to the new onboard voice cards.

When the voice ports are not being used, the Router Plus automatically allocates the bandwidth reserved for them to data traffic. In the event of failure, a new dial backup modem that fits in the Router Plus chassis can automatically kick in.

"It is an interesting product in that it can provide the deterministic qualities that SNA demands, while at the same time support nondeterministic TCP/IP and voice," said Tom Nolle, president of CIMI Corp., a consultancy in Voorhees, N.J. "I am not sure users would want to build an entire backbone out of Router Pluses. They serve a quality role at the edge of the network, feeding information onto the corporate backbone."

Fred McClimans, program director of LANs for Gartner Group, Inc., a consultancy in Stamford, Conn., said Router Plus would be useful for users with multiple access devices and parallel voice/data nets.

"There really isn't anything else out there that combines all of this function in one place," he said. "Plus, it has enough redundancy built in that users shouldn't have to worry if it fails."

Available now, a Router Plus with three SNA/SDLC ports, a single Ethernet or token-ring port, a four-wire PBX interface, a single T-1 V.35 interface, fractional T-1 capability and a dial backup modem sells for $12,500.

✆Hypercom: (602) 866-5399.

IBM

Continued from page 16

With AnyNet on VTAM 4.2, Transmission Control Protocol/Internet Protocol users will be able to access TCP/IP Sockets applications on a mainframe over an APPN net.

Analysts said adding AnyNet to VTAM was an important step in filling out IBM's AnyNet strategy, but lots of work remains.

"AnyNet pretty much still makes the sound of one hand clapping because no one knows what to do with it," said Dave Passmore, an independent analyst based in Reston, Va. "For AnyNet to be successful, IBM needs to get it on all its platforms and other vendors' systems."

To help users keep SNA and APPN networks operating efficiently, IBM announced two performance management products for NCP.

NTuneMON replaces IBM's existing NCP monitor, NCPMON, and gives users the capability to monitor in real time major NCP activity, such as line utilization, buffer pool usage and data communication flows. NCPMON reported NCP statistics only in a historical fashion.

NTuneNCP lets SNA users for the first time tune their SNA nets without having to take NCP down.

In addition to all of the software, IBM added a new low-end 3745 to its FEP family. Designed for small remote offices or midsize users that need more capacity, the 3745 Model 17A supports 10 Enterprise System Connectivity channel ports, 21 Token-Ring local-area network connections and up to 20 Synchronous Data Link Control lines at speeds up to 2M bit/sec. It can also be configured to support 500 SDLC lines at speeds up to 64K bit/sec.

✆IBM: (914) 642-6238.

For more information on Hughes LAN Systems products and services, complete and return this postage-paid card, call 1(800) 395-5267 or fax (415) 966-7990.

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☐ 13-24 months

How many nodes do you plan to network? ____

What is your responsibility in the purchase decision process?

☐ determine needs/features
☐ evaluate/recommend suppliers
☐ authorize purchase
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Who is your LAN supplier(s)? _____

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HIGH-SPEED NICS

Sun to roll out ATM and fast Ethernet adapters

BY CHRISTINE BURNS

Mountain View, Calif.

Sun Microsystems, Inc. last week announced Asynchronous Transfer Mode (ATM) and fast Ethernet adapters that will help SPARC workstation users support data-intensive network applications.

The adapters will let users of Sun's SPARCstation workstations share interactive applications and large files across local- and wide-area networks at speeds much greater than allowed using 10M bit/sec Ethernet adapters.

The SunATM adapter will sit inside SPARCstations running Version 3.2 or higher of SunSoft, Inc.'s Unix-based Solaris operating system and will provide data transfer rates of 155M bit/sec over unshielded twisted pair or fiber cabling.

PRICED RIGHT

Sun plans to deliver its unshielded twisted pair version of the adapter in August for $995, less than half the price of similar products from Fore Systems, Inc. and Network Equipment Technologies, Inc.

The fiber version of the SunATM adapter card will be available in May for a cost of $1,295.

"Sun should be able to deliver a high-speed adapter at that price point because it is machines like their own that are driving the demand for high-speed data transmission," according to Kathryn Korostoff, president of Sage Networks, a consultancy based in Natick, Mass.

Many times, the reason why users don't migrate to higher speed technologies is that they have to sacrifice what they've already spent on hardware and applications.

SunATM will support several industry-standard transport features such as support for the ATM Adaptation Layer over Synchronous Optical Network (SONET) and the Synchronous Digital Hierarchy physical layer framework — SONET's European counterpart.

Sun will also include Transport Control Protocol/Internet Protocol support on the adapter so that customers can run existing TCP/IP applications at ATM transfer speeds.

In addition to giving SPARCstation users a means to tie into ATM networks, Sun will also deliver an adapter that allows them to connect to fast Ethernet systems.

The SunFastEthernet adapter also will reside in a SPARCstation running Solaris 3.2 or higher, but will give users a choice of operating at either 10M or 100M bit/sec. An autosensing capability will allow applications that run on traditional 10M bit/sec Ethernets to run on the same adapter as those that support the high-speed Ethernet.

SAFEGUARDING INVESTMENTS

According to Anil Uberoi, group marketing manager for networking products at Sun, the SunFastEthernet adapter will help protect users' investments.

"Many times, the reason why users don't migrate to higher speed technologies is that they have to sacrifice what they've already spent on hardware and applications," Uberoi said.

Sun beams on ATM market

Comparing Sun's forthcoming Asynchronous Transfer Mode (ATM) adapters to the competition.

Company		
Sun Microsystems, Inc.	Fore Systems, Inc.	Network Equipment Technologies, Inc.
Product		
SunATM	SBA100	Network Interface Card
Price		
$995	$1,295	$2,500
Availability		
August	Now	Now

GRAPHIC BY TERRI MITCHELL

"We've laid out the migration path for users of 10M bit/sec Ethernet to work their way up to Fast Ethernet."

The SunFastEthernet card will be available in May for $795.

Both SBus adapter boards will be manufactured and sold by Sun Microsystems Computer Corp., the division of Sun that handles hardware development and systems integration of Sun products.

✆SMCC: (800) 880-4786.

When we asked our engi with 100% uptime and 6 they went

Introducing Matrix UPS
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The challenge: eliminate the tough installation, burdensome service contracts, high lifecycle costs and threat of a single point failure that plague existing midrange UPSes.

The solution: Go to pieces. Package premium power protection in an innovative modular design.

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Matrix modularity means reliability

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Matrix modularity means low lifecycle costs

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Unlike older ferro-based designs, Matrix is compatible with servers which employ power-factor corrected power supplies. Standard 3-wire 208V input means no re-wiring

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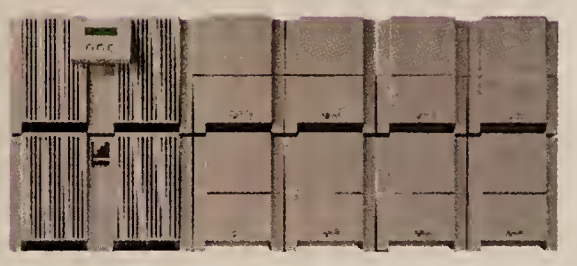

For multiple servers...

Systems	Stnd * Matrix	Stnd Runtime
10 Compaq SystemPros	5000	10 minutes
10 RS/6000s w/ 19" mon.	5000	10
15 386/33s w/VGA	5000	10
4 Sun 4/490s	5000	11

For midrange systems...

Systems	Stnd Matrix	Stnd Runtime
2 DEC Vax 4000-500s	3000	12 minutes
3 HP 9000s	5000	11
IBM AS/400	3000	13
inc:9406 E45 proc., 9337 DASD, 7208 tape, 3477 dis.		

* Shown as standard configuration. For additional runtime, simply add more SmartCells.

Electronics Module

Matrix offers a control panel in four languages, plus programmable output voltages, automatic bypass and more. Best of all, even the electronics module is completely hot-swappable for maximum system uptime.

Line-interactive design with online inverter means high-reliability, low operating costs. The unit's surge protection is backed by APC's $25,000 ABSOLUTE Downstream Protection Policy which will repair/replace any equipment damaged by a surge while protected by Matrix (see details).

Matrix provides auto-shutdown support of all major network, and midrange OS. The SNMP-compatible Matrix also supports APC's Measure-UPS *which meters temperature and humidity, and monitors smoke, fire, water, and security detectors.*

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Circle Reader Service #14

Clariion, Conner attack LAN storage problem with RAID

BY CHRISTINE BURNS

Conner Peripherals, Inc. and Data General Corp.'s Clariion business unit last week introduced separate RAID products that let users store and manage LAN-based data across enterprise networks.

By using Redundant Array of Inexpensive Disks (RAID) technology across an enterprise, a network manager can ensure the integrity of server-based data.

Conner Storage Systems, a Lake Mary, Fla., division of Conner Peripherals, rolled out its CR6-RAID system, a six-disk drive array for NetWare 3.1X and 4.0X servers that gives users up to 6G bytes of storage capacity and can be managed centrally via application software available from Conner.

According to Bernie Wu, vice president of Conner Storage Systems, the CR6-RAID system supports RAID Levels 0, 1 and 5 configurations and is available in either software or hardware implementations. The software version relies on the NetWare server's processor to perform RAID algorithms and write data to disks, while the hardware option requires an extra personal computer adapter board within the array to control RAID calculations, Wu said.

Jim Porter, president of Disk/Trend, Inc., a research firm in Mountain View, Calif., said the Conner Storage Systems software option gives users a less expensive alternative to hardware packages, the standard format for most RAID products.

"For larger systems where most of the server power is already being used, the hardware approach would still be the most appropriate," he said. "But if a systems administrator has an underutilized server, this would be a good use of that extra power."

Conner's CR6-RAID hardware product has six hot-swappable Conner FilePro Performance 1060 disk drives, each with 1G byte of capacity. For fault tolerance, each unit includes an on-line spare drive, redundant power supplies and dual cooling fans, and each has an audible alarm that sounds if any of the drives, power supply or fans should fail. The product transfers data over a fast Small Computer System Interface at a rate of 10M byte/sec.

A high tolerance rate

Shipments of RAID fault-tolerant subsystems for PC-based LAN servers are expected to triple by 1996 as server capacity grows.

SOURCE: INTERNATIONAL DATA CORP., FRAMINGHAM, MASS.
GRAPHIC BY TERRI MITCHELL

All CR6-RAID units are also shipped with Conner's Array Management Software, which provides a graphical user interface and lets a systems administrator remotely control and monitor them on multiple servers from any workstation on the network.

The software RAID product, called CR611DE, starts at $10,995. The hardware implementation, called the CR622DM, starts at $12,995.

Clariion, Data General's Westborough, Mass.-based storage business unit, expanded its RAID product line with one high-end system called the Series 2000 Model 2300 and two low-end devices, the Series 1000 Models 1100 and 1300. The major difference between the new models and existing Clariion products is the introduction of fast-write mirrored caching, a technology that gives users faster access to stored data.

The Model 2300 tops Clariion's existing Series 2000 line by supporting up to 20 disk drives and 40G bytes of data storage. Mirrored disk caching enables the system to support up to 3,200 input/output requests/sec, according to Data General testing. Joseph Uniejewski, director of marketing at Clariion, said existing Series 2000 models can be modified to support mirrored disk caching.

Clariion's low-end models target small and midsize Novell, Inc. NetWare and Unix-based local-area networks. Both models support up to 10 drives and 20G bytes of data. Only the Model 1300 supports mirrored disk caching.

All Clariion disk array products support RAID Levels 0, 1, 3, 5 and 1/0. All include redundant power and cooling supplies, and allow for on-line maintenance of drives and storage processors.

Prices for the Model 2300, 1300 and 1100 start at $72,855, $39,791 and $19,100, respectively. All three models are available.

✆Clariion: (508) 366-8911; Conner: (407) 263-3500.

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Circle Reader Service #8

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NET RESULTS

by Mark Gibbs

Microsoft's big networking chance

I was just thinking...wouldn't it be interesting if the network market got shaken up? What if Novell, Inc.'s NetWare and Banyan Systems, Inc.'s VINES were no longer seen as being cost-effective solutions?

These thoughts crossed my mind after reviewing Microsoft Corp.'s Windows NT Advanced Server (NTAS) for *Network World* and being surprised to find out how much Windows NTAS has to offer (*NW*, Jan. 17, page 29).

Windows NTAS is sophisticated, easy to install and pretty fast — tests have shown that the operating system is 60% to 75% as fast as NetWare 3.X. The Microsoft operating system has good security and management tools, and, importantly, it is aggressively priced at $2,995 per server.

The major drawback to using Windows NTAS is that it lacks a true global directory service, along the lines of Banyan's StreetTalk or Novell's NetWare Directory Services. Windows NTAS currently offers an improved version of Microsoft's LAN Manager domain service, but Microsoft officials said the company will have a full global directory service available next year.

The pricing of Windows NTAS is interesting, especially if you consider the cost per seat of the competing products. Assuming that 1,000 users on a server is realistic — something that is debatable — and that you are unfortunate enough to want to use IBM's OS/2 LAN Server 3.0 Advanced, plan on paying more than $86 per user. NetWare 4.01 will set you back around $48 per user and VINES over $8 per user. Windows NTAS rolls in just under $3 per user.

If we're more realistic and consider 250 users per server, LAN Server weighs in at more than $76 per user, NetWare 4.01 at $62 per user, VINES at approximately $33 per user and Windows NTAS at around $12 per user.

Pricing alone, then, makes Windows NTAS an interesting option.

To make Windows NTAS a viable option, the software must be able to deliver service. And when you talk about network server performance, Windows NTAS is not the fastest.

Fortunately for Microsoft, as hardware gets faster and less expensive, the value of highly optimized operating systems becomes less apparent.

Windows NTAS is sophisticated and pretty fast — tests have shown it is 60% to 75% as fast as NetWare 3.X.

Let's say that Windows NTAS can achieve an average of only 50% of NetWare's raw I/O performance.

Going back to the cost-per-seat issue, a 1,000-user version of NetWare would cost you about $48,000, while Windows NTAS would boast a $3,000 price tag.

Now let's assume that you can get a street price of around $40,000 for the NetWare 4.01 system. That's a gap of about $37,000 between the two systems, enough money to go out and buy a faster server platform.

Given that Windows NTAS comes out of the box ready to run on servers with a maximum of four processors, you have quite a choice range. Your choices include Acer America Corp.'s AcerFrame 3000 with four processors for $21,500; Advanced Digital Systems' ADS:MX with two processors for $19,877;and Compaq Computer Corp.'s ProLiant 2000 Model 5/66 with two processors for $15,900.

Those extra processors will not only improve server operating system throughput, but will also run SQL databases and other server-based applications fast. With the rest of the leftover cash, you should even be able to afford faster disk drives and more random-access memory.

In short, Windows NTAS provides for an exciting scenario. You buy a network operating system that is less expensive and a little slower, but you can afford to put it on killer hardware to regain the lost performance. Better still, Microsoft officials told me that they believe they can crank up Windows NTAS' performance to within 5% or 10% of NetWare 4.X's performance by year end.

With Windows NTAS, we potentially have a platform that can not only supply some serious network I/O, but can run all of the standard Windows applications at the same time. You could even build server-based applications using Microsoft's Visual Basic tools.

Microsoft's challenge is to convince you that its new network baby is adult enough for the job. Watch out Novell — with those potential performance improvements and the advantage of being able to run a slew of Windows applications, Windows NTAS may get a serious look from corporate users.

At less than $3,000 to try it out, many users will do just that.

Gibbs is a consultant and writer based in Ventura, Calif. He can be reached at (805) 647-2307 or on the Internet (mgibbs@rain.org).

Comments

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ONcore presentation: A higher capacity hub

	ONline System Concentrator	ONcore Switching System
Ethernets	3	8
Token rings	7	17
FDDI rings	4	8
Backplane throughput	2G bit/sec	13G bit/sec

Chipcom's ONcore Switching System hub not only has a higher LAN density than the ONline System Concentrator, but also offers more than 6 times the throughput.

GRAPHIC BY TERRI MITCHELL SOURCE: CHIPCOM CORP., SOUTHBOROUGH, MASS.

ONcore

Continued from page 24

and be available in the first quarter.

Ethernet switching modules, which will provide dedicated 10M bit/sec links to the desktop, will be available for the ONcore sometime after Chipcom's merger with Ethernet switch vendor Artel Communications Corp. is completed next month. Token-ring modules developed with IBM will debut this summer.

Chipcom also plans to deliver a two-slot ATM switch module and complementary ATM interface modules in the second half of this year.

"Chipcom has decided to be a little coy and not preannounce some capabilities that might change form over the next 12 months," said Fred McClimans, program director at Gartner Group, Inc., a consultancy in Stamford, Conn. "The platform itself seems very sound, but the real question is how tightly and rapidly the IBM technology and switching features can be integrated into the device."

A key piece of Chipcom's strategy for tying everything together will be based on a distributed management scheme. A Distributed Management Module (DMM) will take up a single slot and provide Simple Network Management Protocol capabilities for all networks supported by the hub. Network-specific Monitor Cards residing on the separate interface modules will compile management data and statistics for the nodes they support and pass that information to the DMM.

ONcore will be available by April and will cost $6,995. The 24- and 10-port Ethernet modules will cost $5,095 and $5,295, respectively. The DMM, which will be priced at $3,695, and the Ethernet Monitor Card, which will be tagged at $1,495, will also be available by April.

LANNET

Continued from page 24

100M bit/sec Ethernet.

"As users grow their enterprise nets, they'll want to migrate from shared-bus architectures to switch-based environments because they [will] want more bandwidth and speed for their client/server applications," Fogel said. "Simply offering higher speed technologies, such as FDDI and fast Ethernet, is not enough. You have to offer switched versions of those technologies."

In order to link local-area networks into ATM environments, LANNET and GDC will develop a series of ATM bridge/router modules for MultiNet.

These modules will allow the interconnection of MultiNets across an ATM backbone, as well as enable MultiNet users to access public net services through ATM switches such as GDC's Apex device..

Under the first phase of this ATM plan, the companies will develop a module, dubbed Pathway, that will tie MultiNet's quad-Ethernet backplane into a 155M bit/sec Synchronous Optical Network Optical Carrier-3 ATM backbone via the Apex switch. In Phase 2, another module, called Highway, will provide similar access to MultiNet's cell switching backplane. Both modules will be available by early 1995.

According to Fogel, access to an ATM backbone will enable net managers to extend the MultiNet's virtual LAN capabilities across an enterprise network.

A virtual LAN is a software-defined group of users that may be geographically dispersed but have access to the same resources and applications as if they were physically located on the same LAN at the same site.

During the first half of the year, LANNET will support the creation and management of virtual LANs via its net management applications, which run under Hewlett-Packard Co. OpenView, IBM NetView/6000 and SunConnect SunNet Manager.

✆LANNET: (714) 891-5580.

NetWare

Continued from page 24

is the highest priority, Microsoft will likely prevail.

"We like [NetWare] 4.0's directory services and server management features, but desktop management is a priority for us," said the MIS manager at a petroleum refining company interviewed for the study. "That's why we're leaning toward NT.

"We have 150 to 200 servers and 2,500 desktops — the desktop is where we need help, and Novell doesn't assist us in that," the MIS manager said. "From what we hear, NT [will] manage the remote desktop."

But Microsoft has too many strikes against it — and Novell has such a large installed base — to upset the balance of power in the LAN network operating system market, according to the study.

"Given Microsoft's past experience with networks, it is unlikely that we'll use NT as a network operating system," said an MIS manager at a major transportation company interviewed for the study. "Everyone thought LAN Manager was going to replace [NetWare]. But it wasn't robust enough and did not address the needs of the LAN administrators."

The overriding factor in Novell's favor, Callahan said, is the company's huge installed base. "We are awestruck by NetWare's penetration and the fact that it continues to increase," he added.

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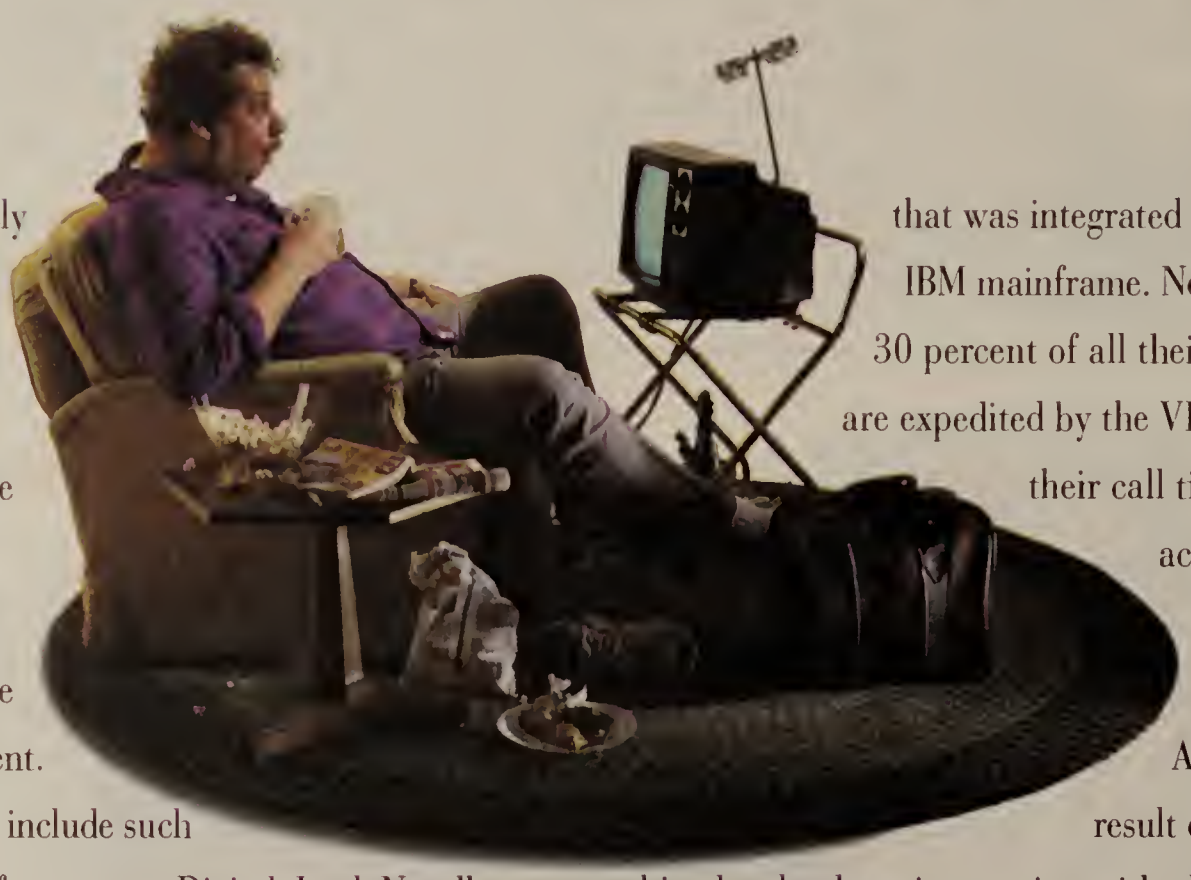

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Carriers, vendors should share fraud liability

BY DAVID ROHDE

Washington, D.C.

The Federal Communications Commission's move to thwart private branch exchange and pay phone fraud through shared liability and more extensive warnings doesn't go far enough.

That was the consensus of a number of parties commenting on the FCC's proposed rule making on toll fraud (*NW*, Dec. 13, 1993, page 21). Not only carriers but also equipment manufacturers and even maintenance firms should be required to make their systems safer and share liability for losses rather than simply issue warnings about fraud, they said.

Among the respondents were more than a dozen AT&T customers who are members of the National Definity Users Group. They sent an identical comment letter at the request of the group's past president, Sally York, a telecommunications manager at USL Capital in San Francisco.

"It is critical that [customer premises equipment] ship without default passwords that are well known within the hacker community," the letter said. "CPE [vendors] should be required to include security-related hardware and software in the price of their systems. When you buy a car, the lock and key are provided in the design and price of the car."

A number of commenters took the opportunity to propose exactly how they would split fraud liability among all parties.

Citing the $50 user liability cap on calling card fraud, the American Petroleum Institute (API) pro-

See **Fraud**, *page 36*

General Electric, Avis go into Tariff 12 resale

Pioneer AT&T reseller Hertz signs deal with MCI.

BY DAVID ROHDE

Oklahoma City

Divisions of Avis Corp. and General Electric Co. have set up telecommunications resale operations that piggyback on their AT&T Tariff FCC #12 deals, a move some observers said may portend more of the same from other large users.

Meanwhile, an official of Hertz Technologies, Inc., the division here that has become known for reselling capacity leased under its Tariff 12 deal, confirmed that his company has signed a similar deal with MCI Communications Corp..

GE is the largest company to turn its Tariff 12 deal into a resale opportunity. Observers said other large users may follow suit to turn voice communications, normally a cost center, into a profit center — or to at least offset costs.

"They're going out to get a zero-cost telephone system," said Rick Morelli, president of Telecommunications Management Corp., a broker of carrier services based in Yonkers, N.Y.

Such resale programs have traditionally been pitched to small companies spending $1,000 to $5,000 a month on telephone service, said Scott Floyd, director of business development for Hertz. But because these programs are developing more advanced features, they are becoming attractive to companies spending as much as $100,000 a month or more.

"There is no top end for this," Floyd said. One of the attractions of Hertz's MCI deal is it is "postalized" — meaning the same price applies for all calls, regardless of distance, he said.

There is also no charge for dedicated access from the customer's premises to the MCI point of presence, according to one marketing agent.

Using the Hertz-MCI resale option, the agent said he has made a proposal to a bank located 30 miles from any long-distance carrier's point of presence that would save it $1,600 per month in dedicated access charges.

GE's resale program, GE Exchange, is offered by General Electric Capital Communication Services Corp.

Customers of GE Exchange can choose from dedicated and switched services, outbound and inbound calling, and calling cards.

It combines usage on all services, including any international calling, for maximum volume discounts.

Term discounts are available at the rate of 3% for a one-year contract and 6% for a two-year deal.

See **Resale**, *page 36*

Costs uncovered

Companies willing to get into the voice communications resale business via AT&T Tariff 12 deals could find the venture lucrative.

Example of outbound dedicated voice prices

What General Electric Co. pays AT&T without discount:	9.7 cents
What GE pays with volume discount (based on $2.1 million per month in business):	6.89 cents
GE's price to customers:	8.9 cents
GE's profit:	29%

GRAPHIC BY SUSAN J. CHAMPENY SOURCE: AT&T TARIFF FCC #12; GE EXCHANGE, ATLANTA

BRIEFS

GE Information Services this month updated its electronic mail service to support the **1988/1992 X.400** messaging standard. The carrier said it is the first to offer the service in North America and that more than 80% of its X.400 customers have upgraded.

The 1988 specification allows vendors to pick and choose service modules they will offer. The 1992 version adds a few more service modules. With its service, GEIS will support all the new standard's basic features and most optional elements, as well as **X.435** electronic data interchange.

GEIS said it is also testing an X.500 directory service with the **North American Directory Forum.** The directory will allow X.400 users to locate other users' addresses in a single, globally distributed directory. The carrier plans to launch its **X.500** service this year.

PacTel Cellular said it will invest nearly $250 million over the next five years in building **digital cellular networks** in California and Georgia. Its first commercial service is slated for Los Angeles in early 1995. The Los Angeles network will be built on $70 million worth of network equipment from **Motorola, Inc.**, PacTel Cellular said.

Airborne users gain low-speed data capabilities

BY JOANIE WEXLER

Dallas

Network managers looking to construct a "virtual corporation" using wireless networking and other mobile computing technologies gained a tool last week to help users be more productive during travel downtime.

McCaw Cellular Communications, Inc.'s Claircom Communications division said it has extended its previously voice-only AirOne radio network to bring 2.4K to 9.6K bit/sec data networking to airline passengers and crew.

The move marks the first time airborne users can send and receive electronic mail and facsimiles and access commercial information networks, analysts said.

Tom Schoeve, director of information services at Enron Gas Services Corp. in Houston, said the move could give his commodity traders a competitive edge.

A trader, for example, might want to be alerted in the air that a certain index moved by 2 cents. "When he got to the airport, he could call and see if the movement would affect any deals in progress or one about to be negotiated," Schoeve said.

Most users and analysts cited similar enthusiasm for select groups of users, which analyst David Coursey, editor of "P.C. Letter" newsletter in San Mateo, Calif., described as "dataless and desperate." However, they frowned on the service for casual use, given how quickly Claircom's $2-per-minute usage charges will add up.

"There is quite a pent-up demand here because more and more mobile professionals want to be doing business during airplane dead time," said Roberta Wiggins, director of wireless mobile communications at The Yankee Group, a Boston consultancy. "But at this cost, you can't just hang on and plow through all your E-mail messages."

This means enterprise network managers will have to issue corporate policies and guidelines on when and how much to use the technology, observers said.

To use the service, users plug their modem-equipped computing devices into an RJ-11 jack on an AirOne handset on the back of an airplane seat, said Keith Grinstein, Claircom president. A PBX-like onboard telecommunications unit digitizes all outbound communications and passes it over the AirOne digital radio network to the nearest ground station.

From there, traffic is converted back to analog form and passed over AT&T's wired long-distance network to Claircom's switching center in Jacksonville, Fla., which is connected to a variety of wireless and wired networks.

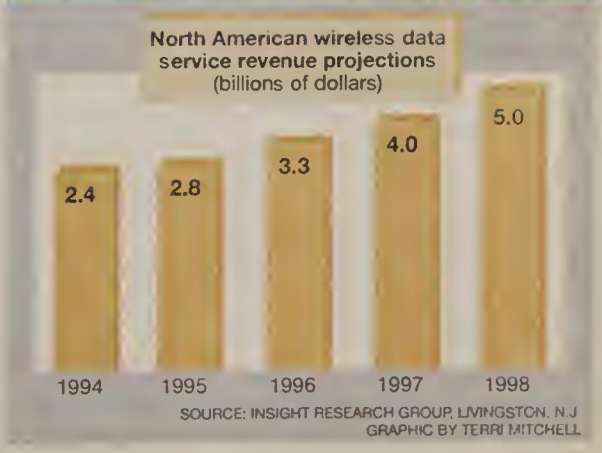
One of Claircom's partners, Southwest Airlines Co., already has the service installed in more than half its planes.

Southwest said it will have the service implemented fleetwide in early February. Northwest Airlines, Inc. is slated to have the capabilities within three weeks, while Alaskan Airlines, Inc. and the domestic arm of American Airlines, Inc. will begin implementation over the next few months.

Some users said most data is not so urgent it cannot wait until a traveler arrives at a hotel room. "Why would users want to pay a premium for exchanging E-mail and faxes from a plane?" asked Bill Sheehan, network project leader at Stone & Webster Engineering Corp. in Boston.

Coursey added, "I have yet to experience a vaguely satisfactory voice connection," which could wreak havoc with data transmissions.

Takeoff for mobile workers



SOURCE: INSIGHT RESEARCH GROUP, LIVINGSTON, N.J. GRAPHIC BY TERRI MITCHELL

User benefits of MCI in the local loop unclear

BY JOANIE WEXLER

The smoke is still clearing as to what bottom-line benefits users might glean from MCI Communications Corp.'s entry into the local access market.

MCI has said that its $2 billion, two-year effort to build a local network infrastructure in 20 major metropolitan areas will allow it to reap huge savings by no longer having to hand over customer access fees to local carriers (*NW*, Jan. 10, page 1). However, observers were divided in their opinions as to how much of those savings would wind up in customer pockets.

"If MCI's costs drop 30%, will users' rates go down 30%? I don't think so," said Daniel Briere, president of TeleChoice, Inc., a consulting firm in Verona, N.J. "MCI will probably drop prices some but use most of the money to get into new markets."

When MCI enters the local market, it's called a competitive move. If AT&T were to try it, it would be called a monopolistic threat.

Daniel Briere
TeleChoice, Inc.

He cited wireless, multimedia and expansion into Mexico and South America as ventures MCI must pursue to remain competitive with AT&T.

But David Passmore, an independent networking consultant in Herndon, Va., said it is unlikely that savings from the carrier's MCI Metro venture would get sunk into other businesses because MCI will initially be concerned with recouping network construction costs.

"I'm not sure they'll have a big enough profit to subsidize other operations for a long time," he said.

Meanwhile, the regional Bell holding companies "will have no choice but to lower prices because of the added cream-skimming of their business from more bypass competition," Passmore predicted.

Bill Coopman, manager of telecommunications at agricultural equipment firm Deere & Co. in Moline, Ill., agreed. "The RBHCs will fight tooth and nail not to lose that business," he said.

Coopman, who is also a member of the telecommunications public policy committee for the International Communications Association user group, pointed to evidence of such RBHC behavior. A proposition by Deere to bypass Ameritech and US West, Inc. networks with a microwave link to an AT&T point of presence last year drove the two RBHCs to respond with an offering "that made it unattractive for us to do it ourselves," he said.

Jerry Noble, national director of telecommunications and personal computer support at the American Cancer Society in Austin, Texas, said the MCI move could be his organization's ticket to implementing technologies it cannot afford today because of high "last-mile" prices.

Switched 56K bit/sec services are commonly used for videoconferencing, for example, but access to those services costs $250 or more per month at each site.

"This makes it pretty damned expensive to deploy on a large scale," Noble said. "But perhaps we could go to MCI and bargain to get the local loop costs down to a palatable price that allows us to deploy the technology."

One market force that could derail local price cuts is the long-distance carriers' historical reluctance to engage in price wars. The carriers' unified efforts at preserving revenue culminated in overall service costs rising for the first time last year, Passmore said (see story, page 37).

In addition, long-distance service providers — not users — generally choose the local access supplier in large contracts. An expected reluctance from the likes of AT&T and Sprint Corp. to hand over local business to their long-distance rival left users wondering if it would benefit non-MCI customers.

"I don't know how the politics will work out with AT&T turning to MCI rather than the RBHCs," Noble said. "But if [AT&T has] the option of losing or winning a whole deal based on going to MCI, market forces will probably come to bear."

Both AT&T and Sprint said they will evaluate MCI equally as a local access candidate in their customer contracts.

Sprint already participates in the local business to a degree; it owns nine local telecommunications divisions that operate in rural areas across 19 states. AT&T is prohibited from entering the local market by the Modified Final Judgment that governs its divestiture decree.

Resale

Continued from page 34

Rates start at 8.9 cents per minute for calls over a dedicated access line and 12.1 cents per minute for calls using switched access. It also offers a postalized option at higher rates.

GE reportedly pays charges under Option 7 of AT&T Tariff 12.

This option bears rates as low as 5.5 cents for calls up to 292 miles for dedicated service (one GE location to another), but the rates are 9.7 cents a minute for dedicated service to non-network locations.

The company is required to spend a minimum total — domestic and international — of $64.7 million a year. But it gets a 29% discount for any amount of domestic usage over $2.1 million a month (see graphic, page 34).

An Avis spokesman said the company has been reselling Tariff 12 to its own corporate customers for a while. But a marketing agent said the company is now for the first time recruiting independent agents for a more widespread campaign.

Hertz's Floyd cautions users toying with the idea of starting their own resale operation that not all companies are equipped to handle the business.

He and others noted that the reseller is responsible for checking the credit worthiness of applicants and working with the carrier to provision the service on a timely basis.

"A dangerous thing to do would be to 'carte blanche' accept everybody and actually reserve more business than the infrastructure can support," Floyd said.

Some companies looking into Tariff 12 resale deals are interested in a "pseudo-Friends and Family" approach where they would sell primarily to existing customers of the parent company, said Michael Greenspan, president of MBG Telecom, Inc., a consulting firm in New York.

"It's really a favored-nation kind of arrangement," said Greenspan, a Tariff 12 expert. "I think there are a lot of companies interested in that."

He contrasts that with the more aggressive strategy of GE. Its basic idea is "to buy it for a nickel and sell it for six cents with no overhead," Greenspan said.

To deal with the growth in the resale industry, which is coming both from traditional user companies and independent switchless resellers, the Telecommunications Resellers Association last month hired Ernie Kelly, former chief lobbyist for Communications Satellite Corp., as its executive director.

"I've been absolutely blown away by the surge of interest since I walked in the door," Kelly said. "It's a very hot industry."

Fraud

Continued from page 34

posed a similar approach for other kinds of toll fraud.

Users should be liable only for the first four hours or $500 worth of unauthorized calls, API said.

By the time the four hours are up, the carrier would be required to notify the user of an unusual calling pattern — and "leaving a message on voice mail early Saturday morning" would not count.

If notification did not occur, under API's proposal the carrier would be liable for 50% of any further losses.

Gary Jensen, manager of voice communications for Walgreen Co. in Deerfield, Ill., suggested that toll fraud liability be split 25% each among users, long-distance carriers, local exchange carriers and equipment manufacturers.

Jensen, who is chairman of the Unauthorized Access Committee of the International SL-1 Users Association, said Walgreen has been victimized twice by toll fraud.

Equipment manufacturers should also be compelled to fortify their systems against fraud, API said.

"API is concerned with the practice of some CPE providers of characterizing such corrections as 'new releases' or 'upgrades' and charging customers for the corrections. This is a shoddy and patently unfair practice," the group's filing said.

Equipment maintenance firms should be "explicitly recognized" in FCC's rules, API said, in response to the current wave of fraud being perpetrated by hackers who access customers' remote maintenance ports, sometimes using passwords that may have been stolen from maintenance companies.

API reported that "most if not all" of its 300 member companies have been victims of toll fraud.

A different note was sounded by Teleport Communications Group, the alternative access provider that is moving into Centrex service.

"PBX operators are sophisticated telecommunications customers and are in the best position to monitor, detect and correct any fraudulent usage being perpetrated through their equipment," Teleport's comment letter said.

Replies to the comments are due to the FCC by Feb. 10.

RATE & TARIFF MONITOR

by Eric Paulak

AT&T, MCI jack up rates again

When MCI made its big networkMCI announcement earlier this month, Chairman and CEO Bert Roberts said that by entering the local market, the carrier would drive down the costs it pays for local access. As a result, MCI's total long-distance costs would go down, and those savings would be passed on to customers. Sounds great, doesn't it?

But what Roberts didn't tell you was that at the same time he was making the promise of future lower rates, MCI jacked up rates for just about every switched service by an average of 3.9%. And in a bit of a turnaround, AT&T followed MCI's lead and filed its own 3.9% increase. MCI and Sprint have typically followed AT&T with rate increases.

So far, Sprint hasn't announced any increases. They are "studying the market conditions." Translated, that means you can expect Sprint to announce its own increase within a couple of weeks.

This is the second across-the-board 3.9% increase for switched services by AT&T and MCI during the past six months. The only difference between this round and the August 1993 rate hikes is that the August increase also included private-line rates.

What does this mean to you? If you're still paying month-to-month rates with any of the long-distance carriers, your costs are going to continue to increase — probably as often as every six months. Here's how this current round of increases will affect you:

For AT&T's 800 Readyline service, the average increase is roughly 3.9%. (Actual increase amounts aren't yet available.) A three-minute call in Service Area 1 (to a neighboring state) would cost about 77 cents. Under the old rate, the same call would cost about 74 cents.

For a three-minute call with MCI's 800 Business Line Termination Service, the rough equivalent of AT&T's 800 Readyline, the old rate in Range 1 was 70 cents; the new rate is 73 cents.

That may not seem like a big deal, but for an inbound call center that does 50,000 minutes a month, it's a $5,460 per year difference for MCI and a $6,000 per year difference for AT&T.

On the outbound side, for AT&T's Megacom Plus, the cost of a three-minute, 200-mile call will jump from 70.5 cents to 72.6 cents. The same call under MCI Vision service escalated from 70.7 to 73.4 cents. For an outbound call center doing 50,000 minutes a month, that's a difference of $5,400 per year for MCI and $4,200 per year for AT&T.

So why the back-to-back increases? The carriers don't want you as month-to-month customers. They want to sign you into a term agreement and lock you in for one, three or five years. In return, they will give you discounts of 5% to 15%.

Better still, they would like you to sign a contract tariff — like AT&T's Tariff 12 — in which you bundle all your inbound and outbound services into one deal for added savings.

As another incentive to sign a contract, AT&T, MCI and Sprint have been offering signing bonuses. They include everything from waiving installation fees to giving you one month of free service for every year you commit to.

These bonuses may just sound like gimmicks to get you to lock yourself into a long-term deal, but they're the best deal you're going to get right now. The only relief for month-to-month rates is going to come when the cost of local access has been cut substantially or the Baby Bells are let into the long-distance market.

But don't expect either in the next two to three years. MCI doesn't expect its new MCI Metro competitive access service to lower its local access rates for at least two years. The FCC isn't expected to open switched access services to full competition for at least two years.

And even if any of the recent bills introduced in Congress to free the Bells of divestiture restrictions passes, they're meant to be phased in over five years.

Paulak is associate publisher for the Center for Communications Management Information in Rockville, Md., a provider of rate and tariff information. He can be reached at (301) 816-8950, Ext. 327.

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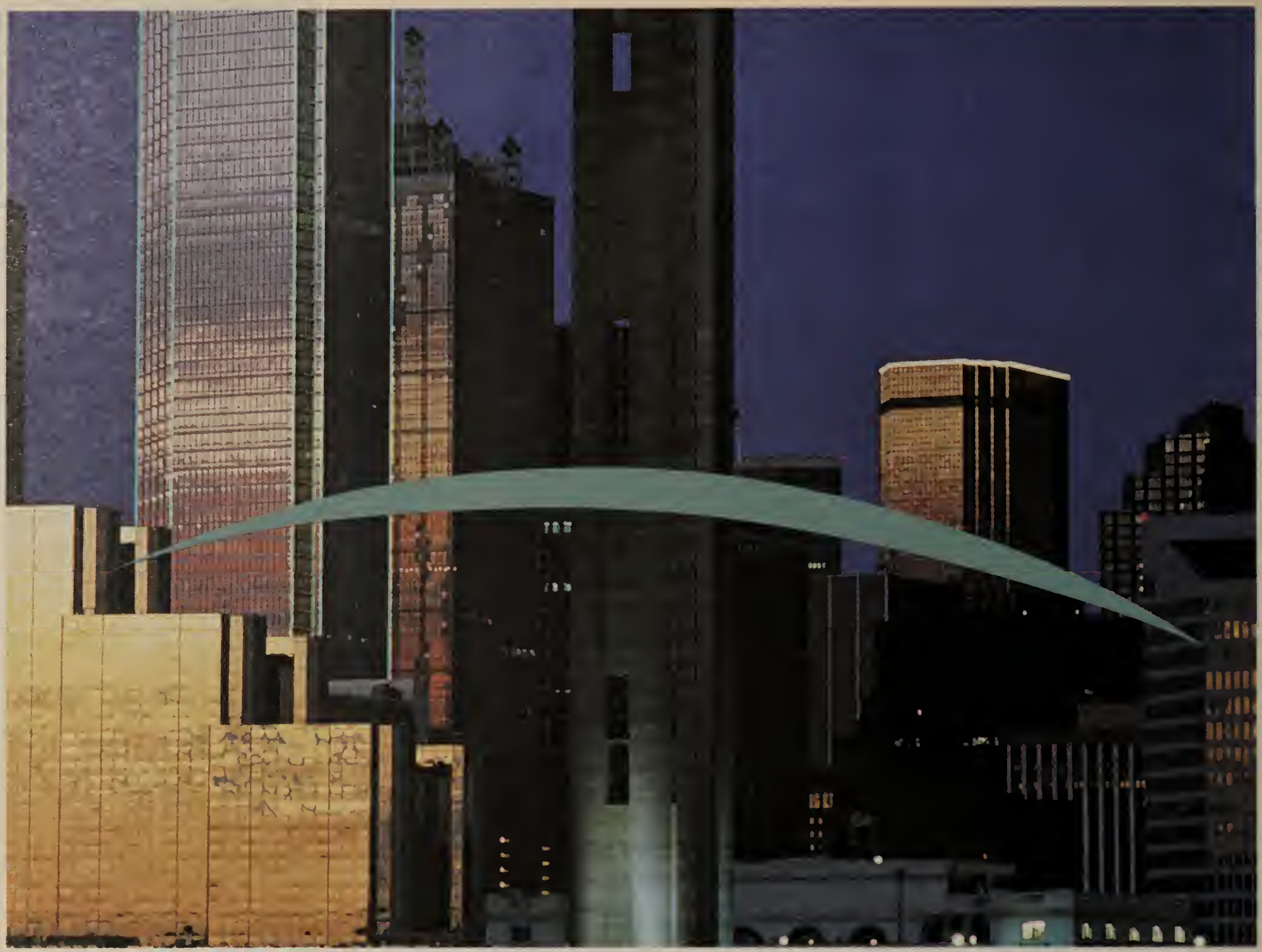

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ALTAIR VistaPoint

*The actual performance varies with protocols and packet sizes used in your network

DISTRIBUTED COMPUTING

Expersoft to launch series of object tools

BY ADAM GAFFIN

San Diego

Taking distributed computing to heart, Expersoft Corp. last week announced a version of its Object Request Broker (ORB) software designed to be dispersed across a network.

Expersoft's XShell ORB Version 3.0 consists of background processes called daemons that are built to run on each client and server on a net, along with a series of management tools. Other available ORBs, including XShell 2.0, reside only on servers.

ORBs serve as message centers for object-based applications, exchanging requests for actions or information between objects on multiple platforms.

Expersoft's approach should result in faster processing of messages between objects, said Hugh Bishop, an analyst at Aberdeen Group, Inc., a Boston consulting firm.

An Object Request Broker (ORB) is software that serves as a message center for objects across a heterogeneous network. Objects on one platform use ORBs to exchange requests for actions or information with objects on other platforms.

The new XShell ORB will come with an object naming service that lets developers give logical names to objects so they can be easily relocated on a net. It will also include programs for monitoring objects, processes and communicationse for distributing new or revised objects across a network.

Bishop said these tools could eliminate a potentially complex problem with a distributed ORB — updating or adding objects across a network.

Options will include a security implementation based on the Kerberos authentication system and a transaction-processing manager. The company said it expects to ship by June an interface definition language that will give its ORB compliance with the Object Management Group's Common ORB Architecture for distributed networking.

Unlike other ORBs, XShell also uses asynchronous communications, which means applications can proceed with the next task rather than waiting for the previous task to be completed.

The software can also be used to encapsulate legacy applications so that they appear to the rest of the network as objects.

Lou DiPalma, senior development engineer for Raytheon Co.'s equipment division in Portsmouth, R.I., has used XShell products for rapid prototyping of applications. DiPalma is looking forward to the security and object-naming features of XShell 3.0.

XShell 3.0 is available for Windows and Windows NT platforms, as well as for SunSoft, Inc.'s Solaris, Hewlett-Packard Co.'s HP-UX, IBM's AIX, Santa Cruz Operation, Inc.'s SCO Unix for Intel Corp. platforms and Silicon Graphic, Inc.'s Irix.

The ORB starts at $9,600 per developer copy and $500 per installed ORB seat.

✆Expersoft: (619) 546-4100.

NASA client/server system to blast off

BY PETER LISKER

Mountain View, Calif.

With close to 25,000 users on the Internet, it might seem that NASA would have only a slightly less difficult job of managing its Internet usage than it would launching the next space shuttle.

But thanks to a new client/server system being deployed by the National Aeronautics and Space Administration's database development team here at Moffet Field, the organization hopes to soon have under control a way of tracking its Internet usage.

The system will feature a set of Apple Computer, Inc. Macintosh- and Sun Microsystems, Inc. SPARCstation-based applications for network administrators that will let them analyze and report on Internet performance and usage at NASA, based on data collected in a Sybase, Inc. database.

ALMOST GIVEN UP HOPE

A three-year effort to develop such a system was almost abandoned until a project team using a rapid prototyping tool from Sybase emerged. Using Sybase's Gain Momentum tool set, a four-member team led by project manager Christine Falsetti expects to deploy the system by February.

"Our efforts prior to using the rapid prototyping environment were disastrous," Falsetti said. "Using the traditional approach and our old tools, we were constantly in the situation of working on a prototype for six months, then finding that the requirements had completely changed. The situation was so bad that we seriously thought about tossing out the whole database and starting from scratch."

The challenge of keeping up with changing requirements and definitions is especially tough when dealing with the Internet. With researchers and scientists worldwide, NASA constantly increases the complexity of its management job by adding new users to the Internet.

Four years ago, NASA decided to build a client/server system to manage Internet usage based on Sybase's SQL Server database system. NASA chose the Sybase software because it considered the database engine robust and believed Sybase had a good understanding of client/server issues.

Using Gain Momentum fundamentally changed the equation. The product, which Sybase acquired last year, is based on a graphical, object-oriented technology that can support NASA users on both Macintosh computers and SPARCstations. Gain Momentum enabled the development team to hold evaluation sessions with key users to demonstrate new design ideas.

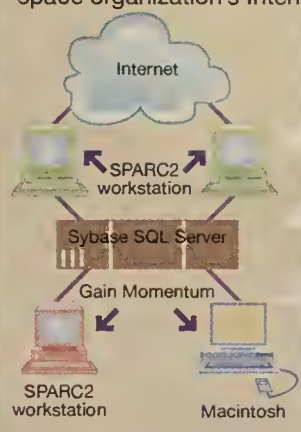
The development team took an iterative approach to using the rapid prototyping environment, incorporating user suggestions into revised versions of applications. This cycle was then repeated, sometimes with barely a one-day turnaround time between prototypes.

"One of the keys to our work was the capability that Gain [Momentum] gave us in terms of making changes to the system and being able to demonstrate the actual working of the system to the user," said Mike Fairley, lead database programmer on the team.

The system will initially be deployed to between 80 and 100 users at the Moffet Field facility. Falsetti stressed that this will not be a beta test, but a full-blown production environment.

NASA client/server application lifts off

NASA has deployed an application to manage the space organization's Internet transactions.



1. Sun Microsystems, Inc. SPARC2 workstations collect Internet performance and usage data at NASA site.

2. Data is fed to Sybase, Inc. database.

3. Site managers overseeing local Internet transactions access performance and usage data at database via Gain Momentum applications.

SOURCE: NATIONAL AERONAUTICS AND SPACE ADMINISTRATION, MOUNTAIN VIEW, CALIF.
GRAPHIC BY TERRI MITCHELL

Moore to update forms management system

BY ROSEMARY CAFASSO

Lake Forest, Ill.

Moore Advanced Services today plans to roll out its next-generation electronic document management system, which is designed to assist large corporations that produce thousands of forms across their enterprise.

DocuMaster Version 2.0, which features a handful of new management modules and support for several additional server platforms, was developed on a client/server model.

The server software handles the storage, distribution and management of forms, while the client handles user input and interfaces to third-party forms packages. DocuMaster works with about a dozen forms packages, including offerings from Delrina Technology, Inc., Jetform Corp. and WordPerfect Corp. Users can load forms designed with these packages and then DocuMaster will store and manage them.

The new version of DocuMaster runs on several server platforms, including IBM's OS/2, Digital Equipment Corp.'s VMS, Hewlett-Packard Co.'s MPE/iX and various Unix versions. Previously, DocuMaster ran on OS/2 only. The Moore software supports more than a dozen server-based SQL database management systems, including those from IBM, Informix Software, Inc., Ingres, Oracle Corp. and Sybase, Inc.

As was true with earlier versions of DocuMaster, the product's client component will run on OS/2 Workplace Shell, Windows, the Open Software Foundation, Inc.'s Motif, HP's OpenLook and DOS.

Beyond additional operating system support, Version 2.0 provides new forms management

See **Moore**, *page 43*

BRIEFS

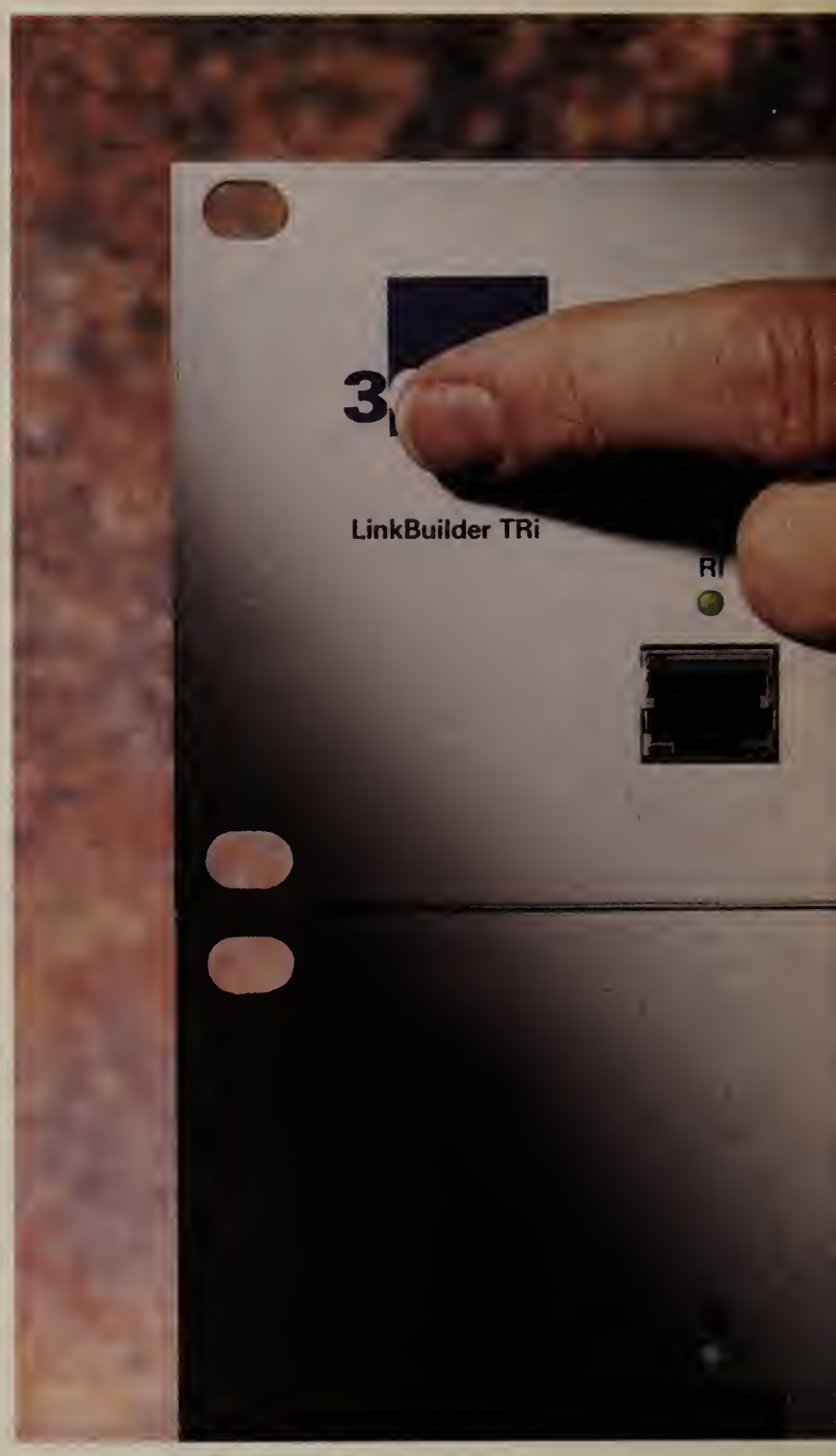
Desktop videoconferencing vendor **InSoft, Inc.** has developed an audio/video synchronization algorithm that optimizes conference quality when users scale bandwidth up or down in response to changing net conditions. The algorithm, InSynch, is used with InSoft's Communique desktop videoconferencing system, which can support as many as 10 users, and the company's InSoft Network Television (INTV), a tool that lets users broadcast video signals to workstations. The firm also announced an application program interface to its Digital Video Everywhere software architecture that will let users and vendors customize InSoft nets by building applications on top of Communique and INTV.

InSoft: (717) 730-9501.

Gupta Corp. last week announced Quest 2.1, a new version of its **data management tool** that features an interface for querying and entering data via forms, along with support for graphic representation of data and a query estimator function. Gupta also announced Quest Reporter, a streamlined version of Quest that provides end users with the ability to query data, build reports and create charts in a graphical environment.

Both products are compatible with Gupta's Joint Application Development framework, which lets users and programmers share in the application development process. Quest has a promotional price of $295 until March 31 and will cost $495 after that. Quest Reporter, due to ship in February, has an introductory price of $149, which will rise to $250 after March 31.

Gupta: (415) 321-9500.



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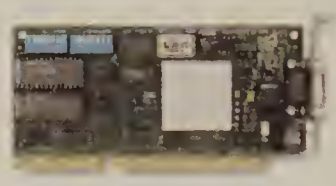

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Circle Reader Service #1

Q+E and Sybase ready ODBC-compliant driver

BY PETER LISKER

Raleigh, N.C.

Q+E Software and Sybase, Inc. have joined forces to develop a custom driver that will let applications compliant with Microsoft Corp.'s Open Database Connectivity (ODBC) specification access Sybase System 10 databases.

The new driver will be packaged in the Q+E ODBC Pack 1.2, a collection of software drivers that allows ODBC applications to interoperate with all major personal computer and SQL databases. In addition, Q+E will include the driver in its ODBC Developer Program kit for developers building applications designed to take advantage of ODBC connectivity.

The Q+E software will enable applications supporting ODBC, such as Lotus Development Corp.'s 1-2-3 spreadsheet and Microsoft Corp.'s Excel 5.0, to access corporate System 10 databases across enterprise networks. The driver will be available on Microsoft Windows and Windows NT, Apple Computer, Inc. Macintosh and Unix operating system platforms.

"ODBC access to Sybase SQL Server will now be much easier and tightly integrated with the release of Q+E's ODBC driver," said Mark Page, vice president of connectivity products for Sybase.

Prior to the release of the driver, users who wanted to connect ODBC-compliant applications to Sybase databases had to use a generalized Sybase offering called DB-Lib. This is a set of routines that gives applications access to SQL services but does not provide a standard for all applications.

Richard Finkelstein, president of Performance Computing, Inc., a Chicago consulting firm, said ODBC support on Sybase servers will benefit users by providing them with increased connectivity options. However, he said the driver could result in a substantial hit on database performance.

The annual fee for Q+E's ODBC Developer Programs for Windows 3.1, Windows NT, OS/2 2.1 and Macintosh System 7 is $2,500 each. A SunSoft, Inc. Solaris version carries a $4,000 annual fee. The new driver is included in the ODBC Pack 1.2, which costs $199. All of these products will ship in February.

✆Q+E: (800) 876-3101.

Moore

Continued from page 40

modules. These include the Master Distribution Module, which controls the distribution method and can distribute forms across multiple operating environments simultaneously; the Master Order Processing Module, which will order the production of forms from an outside source; and the Master System Manager, the systems administrator's window to the system.

DocuMaster Version 2.0, available now, follows the late 1992 launch of the original DocuMaster release. So far, the company has only a handful of customers, but they account for about 10,000 licensed users.

LARGE USER APPEAL

Ronald Bertrand, an analyst and program director with Gartner Group, Inc. in Stamford, Conn., said DocuMaster will likely appeal to large companies that want a more centralized approach to forms management. Current suppliers of electronic forms packages will also eventually provide management tools, Bertrand added.

John Hancock Mutual Life Insurance Co. in Boston has been managing forms from its headquarters and now plans to install DocuMaster Version 2.0 to automate the process, said John Spayne, a materials manager there.

Spayne said John Hancock will create an electronic forms library where users can essentially check out a form or request a large production run of a certain form. Previously, paper copies of forms were stored in warehouses in anticipation of distribution. If a form officially changed, thousands of warehoused copies became useless, he said.

The electronic library will allow storage of a single copy and the automatic distribution of that form at a given date and time. DocuMaster also provides centralized control over the forms, which is critical to John Hancock where changes to its insurance forms could have significant legal ramifications, Spayne said.

The library will be centrally managed, and users will not be allowed to electronically alter forms. Within two months, the insurance company plans to deploy DocuMaster client software to select field offices running Windows. Now, the system is running on a Novell, Inc. NetWare and Sybase SQL Server platform.

DocuMaster Version 2.0 ranges in price from $50,000 for a limited installation license to $250,000 for a more typical configuration.

✆Moore: (708) 615-7832.

ELECTRONIC MAIL

by David Ferris

Addressing E-mail's address hassles

When you connect two different E- mail systems, such as Lotus Development Corp.'s cc:Mail and IBM's PROFS/OfficeVision (OV), you do so by using a gateway. Many factors make a gateway good or bad, such as reliability, performance, vendor support and directory synchronization. But the most important thing to consider is how well users are shielded from unfamiliar address formats.

Different E-mail systems have their own ways to specify addresses. IBM's PROFS/OV requires addresses in an 8.8 format, such as DFERRIS.SFMRKTNG. Forget spaces, long names and the like.

Modern systems are more flexible. Internet names are programmer-friendly, as addresses like d_ferris@fni.com are typical. Personal computer-based E-mail is usually the most natural, while cc:Mail, Microsoft Corp.'s Microsoft Mail and other systems allow names such as Ferris, David or David L. Ferris.

The important thing is that users get accustomed to a given way of doing things. PROFS/OV users prefer their 8.8 names to PC E-mail names, while PC E-mail users like their free-form syntaxes. A good gateway will let users see addresses in the format they are accustomed to.

Gateways translate between address formats in three ways: hard-coded translations, administrator-selectable translations and one-off addressing.

•Hard-coded translations. Here, the gateway administrator manually types a series of address pairs, each describing equivalent formats from two different E-mail systems. For example, the following is a pair of addresses for me in the cc:Mail and PROFS/OV formats:

Ferris, David DFERRIS.SFMRKTNG

When cc:Mail and PROFS/OV users process mail referring to my address, they can now do so using the cc:Mail and PROFS/OV formats, respectively.

Hard-coded translations are often the only tool provided by a gateway. Unfortunately, maintaining the pairs is an enormous pain if you've got hundreds or thousands of users.

•Administrator-selectable translations. Using this method, the gateway provides general-purpose translation rules instead of hard-coded pairs. For example, a cc:Mail-to-PROFS/OV gateway might let the administrator choose between the following rules:

Rule Name	*cc:Mail*	*PROFS/OV*
Last, First	Ferris, David	DFERRIS.SFMRKTNG
Last First	Ferris David	DFERRIS.SFMRKTNG
Last..First	Ferris..David	DFERRIS.SFMRKTNG

SoftSwitch, Inc. and Worldtalk Corp. gateways offer good translations of this type.

Retix's cc:Mail-to-X.400 gateway also offers a fine selection.

•One-off addressing. Even if a gateway has all the translation tools you could want, there will still be times when users will need to deal with addresses in nonstandard formats. One-off addressing will allow you to cope with this situation, such as when you want to send E-mail to an address not already in your mail directory.

One-off addressing is handled in several ways. Preferably, the E-mail software should let users type the address into a structured addressing form. Otherwise, users should be able to type the address into the TO field, prefixed by a short identifying string, such as X400 or INTERNET. Some E-mail systems such as PROFS/OV cannot accommodate either of those options. PROFS/OV's TO field requires addresses in an 8.8 format. In such cases, you may have to insert the X.400 or Internet address in the message, using a special syntax. Finally, if you're dealing with legacy E-mail systems and are really unlucky, you'll have to go to an administator who'll enter the address into the system with an alias in the form expected by our E-mail software. You then send off your message using the alias. Ugh.

•◆ Ferris is president of Ferris Networks, a San Francisco-based E-mail research firm. He writes a monthly newsletter, the "Ferris E-Mail Analyzer," from which this article is drawn.

Editorial

One thing propelled Novell to success: focus. Under Ray Noorda, Novell abandoned the hardware arena and focused solely on providing a cost-effective network operating system that, through partnerships and technology leadership, worked with virtually anything a user had installed.

But now, as the issue of future leadership looms large, Novell's focus doesn't seem so clear. At a recent briefing, outgoing CEO Noorda listened as other Novell officials struggled with questions about strategy and positioning of NetWare, UnixWare and AppWare.

Novell says NetWare 4.X is a network services platform providing connectivity and resource sharing, while UnixWare — the server version — is the application services platform of choice. AppWare is positioned as the development platform for distributed applications.

But that contradicts earlier statements and is a bit confusing.

When it was announced last March, NetWare 4.0 was touted as the enabler of next-generation applications. One executive said, "Our strategy revolves around application services." In fact, this theme of NetWare being the ideal applications platform was sounded at the debut of NetWare 3.X, which Novell called a "superior distributed application environment."

Should users and developers no longer be building applications for NetWare? How can UnixWare be the ideal applications platform in a Novell environment when significant NetWare/UnixWare integration work remains to be done? Where should database servers run? What about smaller offices — do they need both UnixWare and NetWare servers?

After listening for most of the day, Noorda finally spoke up, saying Novell's strategy remains the same: to "grow" the network industry. The company has done that, no doubt. But how it will continue to do that is at issue.

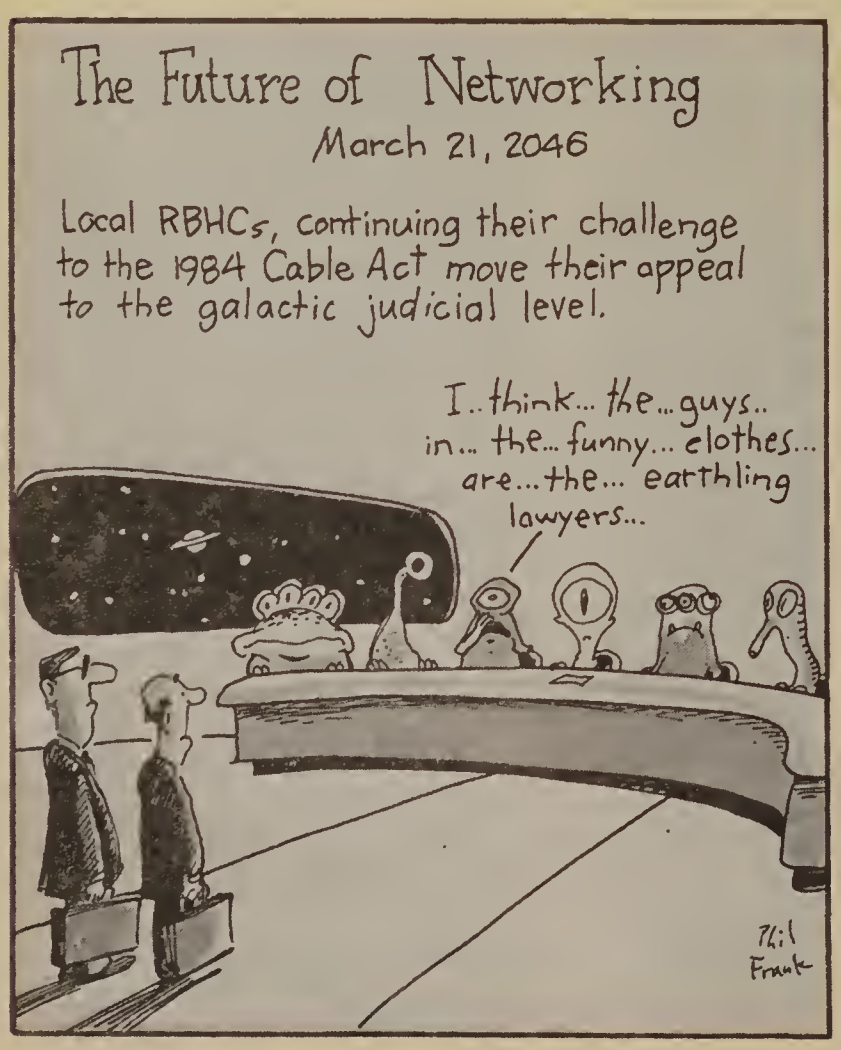
Novell faces three big challenges: convincing its huge installed base of 3.X users to migrate to 4.X — despite the real integration problems with hampering users with both products; getting users to develop core business applications on UnixWare rather than Windows NT, OS/2 or another Unix; and getting users and developers to buy into AppWare.

Nobody questions Novell's need to diversify its product portfolio, but the product positioning is simplistic and raises more questions than it answers. To move the firm to its next level, Noorda or his successor will have to resolve the nagging questions and bring more focus to Novell's strategy.

➾JOHN GALLANT jgallant@world.std.com

TELETOONS

FRANK AND TROISE



CUSTOMER SURVEY

by Jeffrey Kaplan

Users place greater emphasis on service and support issues

Networking vendors must ensure the quality of their service and support or risk losing a significant proportion of their customers. According to a joint survey conducted by *Network World* and Dataquest, more than one-third of the approximately 300 U.S. MIS and network managers surveyed are considering switching vendors because of dissatisfaction with service and support. This finding should send a wake-up call to vendors throughout the networking industry.

The survey results, summarized in the R.A.F. article in this issue, represent a significant shift in focus among users today. In the 1980s, users were driven to acquire the latest networking technology to overcome the disruption to their networking operations brought on by the AT&T divestiture. In the 1990s, users continue to focus on acquiring the latest networking technology to gain a competitive advantage.

But, as economic pressures and industry consolidations have taken hold in nearly every business sector, users are now studying ways to more cost-effectively leverage their networks. To a large extent, this means utilizing the skills and resources of outside vendors to help them maintain and manage their nets.

In keeping with this trend, the survey respondents reported they will reduce the proportion of their net budgets spent acquiring networking products from 43% in 1993 to 40% in 1995. At the same time, user spending on in-house and external support services will rise from 34.3% in 1993 to 36.4% in 1995. This may not seem like a significant shift, but it is indicative of a change in customer focus, which was initially reported in Dataquest/*Network World*'s first joint customer survey last year (*NW*, Feb. 1, 1993, page 1).

In that study, customers reported that they consider a vendor's service and support more important than its product's features, price or reputation when they initially purchase a networking product. The quality of a vendor's service and support also plays an equally important role in a customer's decision to switch vendors, according to last year's survey.

That is why this year's survey results are so significant. Overall, the customer satisfaction scores were positive; on a scale of 1 to 5, with 5 equalling extremely satisfied, scores ranged from 3.6 to 4.1 across 13 networking products/services. However, further analysis shows that there is only a small differential in grades (less than 1.0 in many cases) between those users who expect to remain with their current vendors and those who are likely to switch vendors because of dissatisfaction with the quality of their service and support. The message is clear: Networking vendors can ill-afford to neglect the quality of their service and support in today's highly competitive networking market.

The reasons for customer discontent vary depending on the type of product or service, according to our survey. Modem customers want to see improvements in telephone support, as do local-area network adapter card customers and users of toll-free and virtual private network services. Multiplexer, private branch exchange and intelligent hub customers are looking for better on-site support. LAN operating system and router customers want greater ease of installation and use from their products. In general, customers called for improved response times and greater product reliability.

Another important finding in this year's survey is customers' growing interest in multivendor support. More than 40% of the survey participants said they are interested in having a single vendor support their networking environment. This represents a clear opportunity for those vendors with skills and resources necessary to respond to this challenge.

The vendor preferences that survey participants reported are also enlightening, if not altogether surprising. Customers consider computer systems and net equipment vendors, along with professional services/systems integration firms and value-added resellers, the most likely suppliers of outsourcing services. Interexchange carriers (IXC), the regional Bell holding companies and independent, third-party maintenance (TPM) companies are the least likely to win customers' favor for these services.

The RBHCs have made only a faint effort to penetrate this market, especially with their renewed focus on their primary business of transport services in light of growing interest in the information highway. On the other hand, the IXCs and TPMs have made a concerted effort to penetrate this market. The carriers are actively promoting their "managed network services," while the TPMs are accentuating their "network operations services." Based on the results of this survey, it's obvious that both could be rethought.

Underlying these important findings is the realization that customers are utilizing their nets differently than in the past and looking for different ways to leverage this valuable resource. Much has been written about customers using their corporate nets to support their internal business applications.

This is verified in our survey with 21% of the respondents reporting that electronic mail applications are driving their networking requirements and another 14% identifying document imaging/management as the key driver.

Yet, a new dimension to this theme is the role of nets in business process reengineering, which 13.5% of the survey respondents stated was driving their networking needs. In many cases this means that users are employing their corporate nets to more closely tie them with their own customers. They are looking for vendors to provide them with the skills to do this.

Our survey clearly shows that networking vendors are well-advised to make additional investments in their service and support operations if they intend to remain competitive. These investments should take the form of state-of-the-art call-handling systems to assure consistent telephone support, sophisticated dispatch systems to expedite on-site support, and extensive staff training in the latest in network technology, applications and business consulting skills.

➾Kaplan is director of the Worldwide Services Group for Dataquest, a market research and consulting firm in Framingham, Mass. He can be reached at (508) 370-6174.

PRO CON

Are vendors the group best qualified to offer certification programs to network professionals?

BY JOHN MUELLER

VENDOR-SPECIFIC CERTIFICATION programs hold much more practical value for today's network users than nonvendor-specific programs. While certification by independent groups may sound like a good idea in theory, nonproduct-specific certification is really too general to be of great value to today's network managers.

There are four reasons that the network community needs to continue using vendor-specific certification programs: consistency, specialized knowledge, training and level of understanding.

First, vendors are very motivated to ensure that the people they certify consistently meet the highest standards. After all, the performance level of an individual they certify directly reflects on the vendor's reputation. Both Novell, Inc. and Microsoft Corp. support this notion of consistency by providing the customer with the means for reporting inadequate levels of service performed by a certified individual.

By contrast, independent testing organizations can start out highly motivated to provide such consistency, but what will help them to maintain it? All too often an independent organization becomes entrenched and nonviable after a few years. Witness the criticisms launched against other independent organizations including the American Medical Association. Is this what the network industry really wants?

Second, while independent organizations claim they can provide a generic certification test that will meet the network industry's needs, this is an illusion. If every product on the market worked exactly the same way, it might be possible to create a generic test. Unfortunately, every product is different and, therefore, requires specific testing procedures.

Independent certification tends to work only in occupations where the information required to perform a given task is very generic. For example, it is possible for an independent organization to certify auto mechanics because most automotive procedures are very generic from one car to the next.

Unlike today's cars, implementation details of today's networking equipment vary widely from vendor to vendor. An independent organization simply lacks the tools to create a generic certification that really tests for all the complexities in today's network environments.

Third, while independent programs may provide certification testing, they don't provide the training that vendor-specific programs do. Without training, testing is a mere affirmation of the person's inherent knowledge. A certified individual needs to demonstrate a level of knowledge that exceeds what the average person knows. After all, this is what makes certification a valuable goal to acheive.

Only a vendor can provide the combination of training and testing that assures the customer gets the very best level of service possible. It's the combination of these two items that makes vendor certification essential.

Finally, there are many situations where certification is not enough; the network manager requires support from the vendor. Some vendors even include special testing switches and other methods for verifying the sources of problems with their products. An independent organization cannot test the certified individual's knowledge of these switches and methods since this is normally classified information.

Proponents of independent certification can probably come up with what they consider equally good reasons to support their position. However, whatever justifications they propose for independent certification are overshadowed by the need to fully test individuals in the environment in which they want to work.

Current standardization efforts may allow for independent certification that has actual value to emerge sometime in the distant future. Today, however, the very existence of nonstandard network hardware and software calls for vendor-specific certification.

Mueller is the author of 20 books, including the *Novell Certification Handbook* and the *Microsoft Certification Success Guide* (both published by Windcrest/McGraw-Hill). He can be reached via CompuServe at 75300,576.

BY BOB KILE

THE ONLY VALID industry-standard certification for network technical skills is one that is administered by an independent organization without direct vendor intervention. The existing training and certification programs offered by several industry manufacturers are too limited and biased to address the breadth of real-world problems associated with today's heterogeneous network environments.

A number of manufacturers, notably Novell, Inc. and Microsoft Corp., have developed very effective certification programs. Initially, most of these programs were designed to protect the integrity and performance of the manufacturer's own products in the field by ensuring the products are installed correctly and working properly. Unfortunately, the intent and scope of these certification programs has boiled over into areas for which they were not originally intended. Consequently, we now have many people trying to do jobs they are not qualified to do, and in most cases these people aren't even aware they are not qualified. We cannot continue "not knowing what we don't know." Instead, we must ensure that our industry grows in its professionalism and skill.

The nontechnical world typically perceives that any certification amounts to general network expertise, and that the certified individuals are therefore deeply skilled in all aspects of network design and support. That perception is simply not true. The truth is that a single manufacturer's certification means only that the certified individual is proficient in that manufacturer's own products. Such certification tells little or nothing about that individual's other skills or lack of them.

Consider this analogy: A man is concerned about some upcoming surgery he faces. His friend points out that his doctor had many years of training to be qualified to do this type of surgery; furthermore, the doctor was certified by an independent group of his peers that testified to his ability and skill at doing this surgery. The man can therefore reasonably trust the doctor as a legitimate authority capable of performing his surgery.

In this example, would it be prudent for the man to trust a surgeon who is, say, certified only by the pharmaceutical firm that makes the drugs he uses during surgery? Is that firm qualified to certify the use of another manufacturers' drugs... or a scalpel... or other equipment or techniques used during surgery? Why, then, would a company entrust its network to a net manager with similarly limited credentials?

The National Associataon of Communication Systems Engineers (NACSE) supports and applauds manufacturers' training and certification programs for their own products. But when that certification boils over, either by intent or perception, onto other products and services for which it is not intended, it is no longer valid, and the skill of the certificate holder is in question. We must then ask: What are the certified individuals really capable of? What breadth of skills and experience do they really have?

Certification administered by an independent organization is free of these limitations. Independent certification programs are directed by a standards committee consisting of individuals with a broad spectrum of experience, backgrounds and disciplines who are supported by the industry at large. This structure frees independent programs from the self-interest inherent in vendor-specific certification programs and enables them to produce more well-rounded, qualified network professionals.

We at the NACSE firmly believe that our independent certification program will lend credibility to our membership and the skills that they have to market. We think network professionals need a broad-based background to be effective in the typical open environment. Other professions require certification and recertification. Should we be professionals or should we wallow in mediocrity?

Kile is president of NACSE, a Denver-based nonprofit corporation pushing for vendor-independent certification of network professionals. He can be reached at (303) 689-0825 or via the Internet at 73023.2524@compuserve.com.

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In need *of an* overhaul

IBM's LAN Server-Advanced offers adequate work group capabilities, but its directory service falls short of enterprise needs.

By MARK GIBBS

NET Result

Product:
IBM LAN Server-Advanced Version 3.0

Vendor:
IBM
Old Orchard Road
Armonk, N.Y. 10504
(800) 426-2968

Price:
$2,295

Platforms:
Intel Corp. 80386- or 80486-based servers

Requirements:
- 9M bytes of RAM
- 8M bytes of storage

Key findings:
LAN Server-Advanced is best suited to small- and medium-sized work groups. It offers basic network operating system (NOS) features but does not have some of the features associated with more sophisticated NOSes, such as a global directory service. Its reliance on character-mode utilities gives the software an old and worn look.

Despite its age, IBM's LAN Server-Advanced Version 3.0 network operating system (NOS) may have a little life left, but it is in desperate need of some major improvements. In its current state, LAN Server-Advanced is, at best, suited to small and midsize work groups.

Since the public breakup of IBM and Microsoft Corp. over development of OS/2, IBM has revamped much of LAN Server-Advanced NOS — rewriting a lot of the code and overhauling several key subsystems. Its I/O performance is much better than that of its LAN Manager cousin, and several facilities make it a better networking solution.

IBM has increased the NOS' addressable memory limit to 16M bytes, improved the optional alternative file system, increased the number of open files and locks, and added disk subsystem fault tolerance.

The stripped-down version of LAN Server, called IBM OS/2 LAN Server-Entry, offers basic file server facilities, such as file and printer sharing. In addition, it supports file systems based on either the standard DOS File Allocation Table or the OS/2 High Performance File System (HPFS). OS/2 LAN Server-Advanced supports an enhanced version of HPFS called 386HPFS, which controls user access to files on nondedicated servers. The software also supports mirrored and duplex drives, both of which are fairly common on NOS platforms today.

From a security perspective, we found little difference between LAN Server-Advanced and LAN Manager. We did, however, find that LAN Server-Advanced no longer relies on the antiquated share-level security system employed by LAN Manager. Share-level security provides password-controlled access to shared resources.

With share-level security, any need to change a password requires contacting all of the users and giving them the new password — a difficult and time-consuming task in a large organization.

This type of security is also fragile, for one loose-lipped user can put the network at risk. It is definitely a security model worth abandoning.

INSTALLATION

The installation procedure is less than elegant. Our first hurdle, and a formidable one at that, was the documentation. Written in IBM's dry, bureaucratic style, the manuals are thorough — exhaustively so — about each procedure. The manuals plod through each aspect of installation and operation without any fast-track-type support — there's no way an expert can bypass the tedious implementation instructions.

Complicating the process of getting your network up and running, the indexes in the manuals leave out references to crucial features and services. For example, we were surprised to discover there was no entry for share-level security. For those interested, we did find the information on page 1.21 of the Overview of LAN Server 3.0 manual.

The actual installation was straightforward as long as we did not make a mistake. We found several situations where basic configuration errors, such as the selection of the wrong network adapter card, could not be corrected easily. That's because we had to restart the system with a recovery disk, then go back to the point of failure and make our corrections.

USER TYPES

LAN Server-Advanced defines three user categories: User, Local Administrator and Administrator.

Users can log on or off the network, view their profiles, change their passwords and add comments to their profile. A comment can, for example, describe a user's role within the company.

Local Administrators have the same privileges as users. But, in addition, they can access and manage databases created by IBM's database manager — DB2/2 — product.

Administrators have even more privileges. They can add and delete users and other administrators. They can set user status to permit or deny access, set user passwords and define user rights.

USER PROFILES

All user profiles, or accounts, are given four defining attributes when they are created. These attributes are user identification, password, logon location and time restrictions.

LAN Server-Advanced offers a basic set of account management features. A user ID (IBM-speak for user name) may be up to eight characters long. Passwords, which are optional, must, by default, be a minimum of four characters, although this requirement can be changed. The maximum length of a password is eight characters.

Network managers may also associate expiration dates with passwords to ensure that users change their passwords

Continued on page 49

HOW WE *did it*

We installed LAN Server-Advanced on an 80486-based server with 16M bytes of random-access memory, a 500M-byte disk drive, a Mitsumi Electronics Corp. CD-ROM drive and a NEC Corp. MultiSync 4FG color monitor. We used an Artisoft, Inc. AE-2/C network card to connect the server to our Ethernet network, which included 80486-based clients.

Continued from page 48

periodically. And, to further safeguard the network, LAN Server-Advanced can force users to choose unique passwords rather than allow users to recycle old ones.

Network managers may also configure profiles to prevent users from logging on at multiple workstations simultaneously. Or to deal with the more troublesome users, network managers can simply deactivate a profile. In addition, profiles can be used to restrict users' network access to specific days and times.

DOMAINS

LAN Server-Advanced uses a domain system to support its single network logon system. Domains are a way of logically grouping servers on the network. They can, for instance, group all servers running either LAN Server-Entry or LAN Server-Advanced by departments or building floors.

Information about users and networks is shared among servers in the same domains. For example, when a user logs on to a server from a workstation (called a Requester in LAN Server parlance), that person's account is, in turn, validated for all other servers in the domain. Users can, therefore, access all network resources (if they have the appropriate rights) in the domain with a single logon. This domain system also simplifies management of user profiles — any change to a user account is automatically passed to all servers in that user's domain.

The hitch is that account propagation is limited to a single domain. And while users may log on to two domains, doing so forces them to drop down to the command-line interface and use a special utility to log on to the other domain.

Within any domain, one server must be established as the Domain Controller. This server is responsible for the management and distribution of other databases, which are vital to network security and management.

The Domain Control Database is a directory that contains information describing all of the shared resources in the domain, user logon information and so on. The Master User and Group Definition databases define the users and groups defined for the domain.

The Domain Controller is responsible for replicating these databases to other servers, called Backup Domain Servers, in the domain. The Backup Domain Servers maintain copies of the domain databases and authenticate user logons, even if the Domain Controller is unavailable.

We found the obvious weakness of this domain system. The domains are independent and do not share information with one another. That means LAN Server will not provide the necessary synchronization of user accounts and other data across multiple domains in an enterprise net.

Further, there is no way to browse the system for resources in other domains. The network view is limited to the current domain. Both VINES and NetWare 4.X allow users to merge what are conceptually separate domains into a single hierarchical tree. This enables end users to navigate the tree to search for information or store data about any object or element in the network. LAN Server's domain system, by contrast, provides a more restricted view of distributed resources.

Logging on to another LAN Server domain is not necessarily an easy task. In order to access a network resource in another domain, we had to log on to that other domain. However, LAN Server does not permit users to log on to multiple domains without some significant calisthenics. We had to create identical profile names and passwords to gain access to multiple domains.

While this procedure works, it poses problems for network managers, who must deal with synchronizing the information in the different domains. An optional utility, called Network Signon Coordinator/2, can be used to synchronize user IDs and passwords across multiple domains. But at $45 per client, Version 1.1 of the software is somewhat pricey for remedying LAN Server's logon limitations.

We did discover one other, albeit clumsy, way to access other domains. By executing the OS/2 character mode utility from the command line, we could log on to another domain. However, even IBM admitted that this approach was inconvenient. The approach is neither intuitive nor well explained by IBM. And it requires a level of knowledge that most end users just don't have.

OPERATOR PRIVILEGES

In addition to the privileges associated with their user types, users can also be assigned operator privileges for administrative control of user accounts, print services, communications services and server resources within a domain.

The Accounts Operator Privilege, for instance, allows a user to add, modify and delete users (excluding Administrators) and groups in the domain. The Print Operator Privilege allows the creation, deletion and modification of print jobs and print queues in the domain, while the Comm Operator Privilege allows the user to manage the domain's shared serial I/O devices. Finally, the Server Operator Privilege permits the management of shared resources and viewing and changing of network status such as server outages or print queue congestion.

PROFILES AND PERMISSIONS

Use of shared resources, such as print services, directories and files, are governed by access control profiles. These profiles determine which users may access resources and what they may do with those resources.

A network printer, for instance, may have an access control profile that prevents it from serving certain groups and users. These access control profiles enable network managers to distribute the network resources more efficiently, thus avoiding overuse of certain devices or services.

By default, LAN Server-Advanced assigns no access permissions to users and groups. The administrator must specifically grant these permissions to users. This approach is good because it increases the security of the net. In addition to the permissions granted by the network administrator, users who belong to groups also inherit the permissions assigned to those groups.

The network manager may assign a maximum of eight types of permissions:

- **None** — Denies all access to the resource.
- **Delete and Create** — Control both file and directory access.
- **Read and Write** — Apply only to files.
- **Attributes** — Enables users to change OS/2 file attributes.
- **Execute** — Permits users to run, but not copy, executable files.
- **Permissions** — Allow users to modify an existing control profile for a resource but doesn't allow the creation of a new profile.

For a description of the relationships between access permissions and resource types, see graphic, this page.

AUDITING

LAN Server-Advanced's auditing capabilities are quite comprehensive. For every network resource, flags or switches can be set to record all network accesses or just the failed access attempts. Of course, auditing can be turned off, as well.

The auditing system records as many as 10 categories of events, which include server starts and shutdowns, user logons, user logoffs and access permission violations.

LAN Server-Advanced, like many other NOSes, is capable of generating vast amounts of audit data, particularly if the network is busy. The only problem is that the resulting audit trail consists only of raw data — and IBM hasn't indicated that it has plans for automated analysis tools.

Without such tools, the prospect of having to wade through this mountain of data can deter even the most conscientious net managers.

We found another shortcoming of the auditing system — there is no support for independent auditing, a useful feature that allows the network manager to give designated users exclusive access to the audit subsystem. This independent auditing capability, which Novell NetWare 4.X supports, is a requirement in many accounting audits.

NET RESULT

LAN Server-Advanced offers all the basic features required by network managers, but it is beginning to look, and feel, a little dated. Curiously, it relies on character-mode utilities even though the underlying OS/2 operating system boasts a sophisticated graphical user

Continued on page 67

Controlling access to network resources

The relationship of access permissions to different resource types.

Permission	Files	Printers	Serial devices	Named pipes
None	✔	✔	✔	✔
Execute	✔			
Read	✔		✔	✔
Write	✔		✔	✔
Create	✔	✔	✔	✔
Delete	✔			
Attributes	✔			
Permissions	✔	✔	✔	✔

GRAPHIC BY TERRI MITCHELL

SOURCE: GIBBS & CO., VENTURA, CALIF.

NOS features comparison

Vendor	Banyan Systems, Inc.	IBM	Microsoft Corp.	Microsoft	Novell, Inc.
Product	VINES	LAN Server	LAN Manager	Windows NT Advanced Server	NetWare
Version	5.25	3.00	2.20	3.1	3.12
File system support					
DOS	✔	✔	✔	✔	✔
FAT	✔	✔	✔	✔	✔
OS/2 (HPFS/ 386HPFS)	✔	✔	✔	✔	✔
NTFS				✔	
Macintosh	✔	Optional	Optional	✔	✔
NFS		Optional			✔
Unix	✔	✔			✔
Nondedicated operation			✔	✔	
Maximum users	CD	1,000	CD	CD	250
Maximum RAM	256M bytes	4.2G bytes	16M bytes	4G bytes	4G bytes
Minimum RAM	8M bytes	8M bytes	8M bytes	16M bytes	4M bytes
Memory protection	✔	✔	✔	✔	
Intruder detection	✔		✔		✔
Intruder lockout	✔				✔
Force password changes	✔	✔	✔	✔	✔
Set hard disk quotas		✔	✔		✔
Set group rights	✔	✔	✔	✔	✔
Access controls					
Execute-only	✔	✔	✔	✔	✔
Create	✔	✔	✔	✔	✔
Delete	✔	✔	✔	✔	✔
Write	✔	✔	✔	✔	✔
Change attributes	✔	✔	✔	✔	✔
Directory search		✔	✔	✔	✔
Modify	✔	✔	✔	✔	✔
Read-only	✔	✔	✔	✔	✔
Rename inhibit	✔	✔		✔	✔
Hidden	✔	✔	✔	✔	✔
Sharable	✔	✔	✔	✔	✔
Supervisor	✔	✔	✔	✔	✔
Auditing capabilities					
File access	✔	✔	✔	✔	✔
Object access	✔	✔	✔	✔	✔
Logon	✔	✔	✔	✔	✔
Logoff	✔	✔	✔	✔	✔
System start	✔	✔	✔	✔	✔
System shutdown	✔	✔	✔	✔	✔
System events	✔	✔	✔	✔	✔
System errors	✔	✔	✔	✔	✔
Failed events	✔	✔	✔	✔	✔
Management events		✔		✔	✔
Global directory services	✔	✔		✔	✔

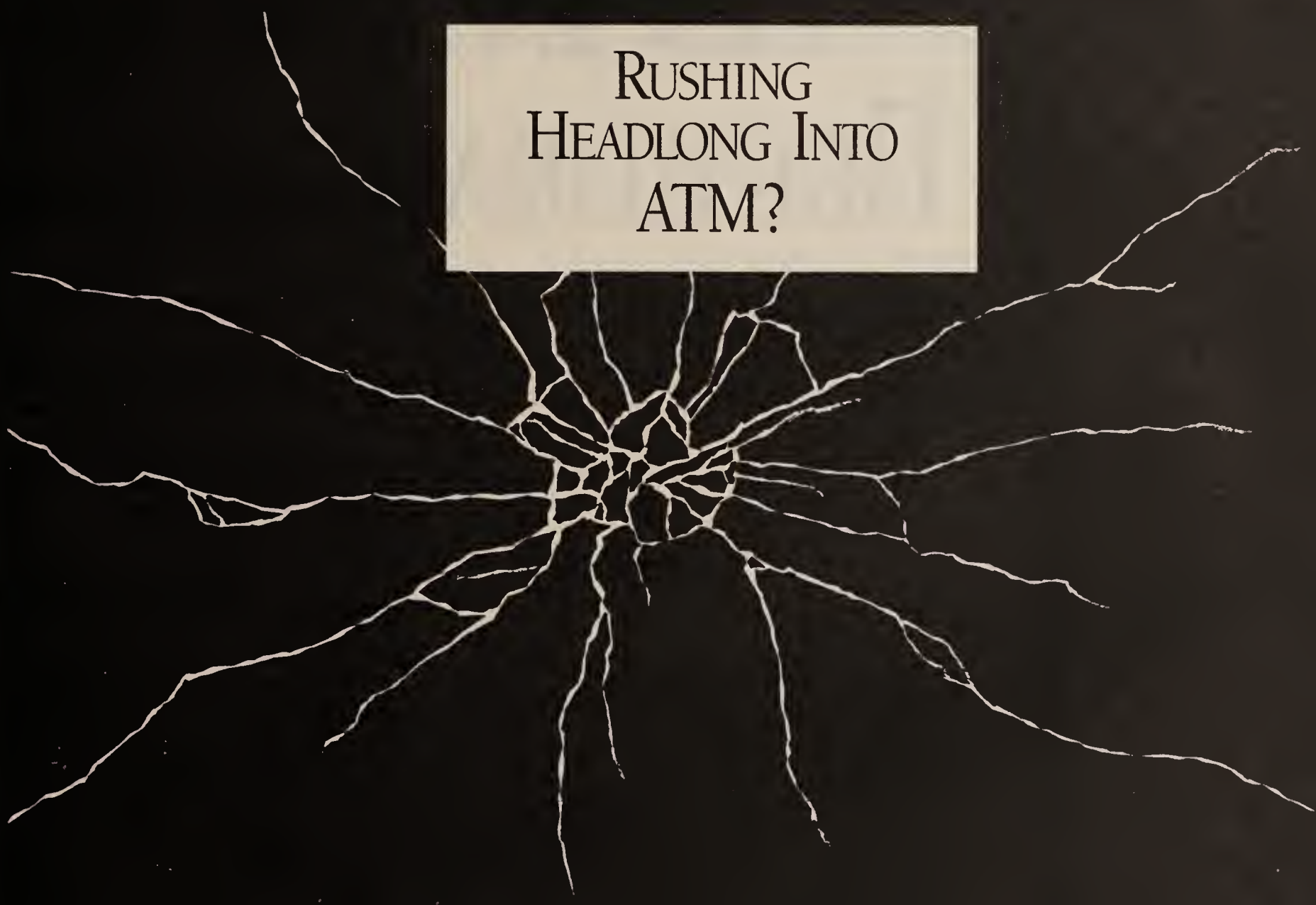
CD = Configuration-dependent
FAT = File Allocation Table
HPFS = High Performance File System
NFS = Network File System
NOS = Network operating system
NTFS = NT File System

SOURCE: GIBBS & CO., VENTURA, CALIF.

What about you?

Now that we've presented our assessment of LAN Server-Advanced, we'd like to hear from you. If you are using LAN Server-Advanced in either a test or production mode, we'd like to hear about your experiences. Please fax them to Stuart Melnitsky, test/reviews editor, at (508) 820-1103 or contact him via the Internet at sm@world.std.com.

Rushing Headlong Into ATM?



Avoid Headaches. An Integrated Broadband Mult

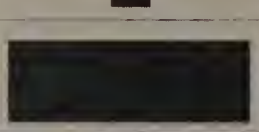
You're moving full speed into ATM. That you're sure of. But what applications will develop first? How soon? And how quickly will they grow? How big an investment should you make today? Ask ten people and you'll get ten answers. The view ahead is anything but clear.

Still, you have to move ahead.

To keep you from running into trouble, we did our homework. We worked with the biggest users and providers of networking. Together, we identified the most important broadband applications on the horizon: enterprise networks, integrated community networks (including distance learning), residential networks and carrier backbone networks.

Then we scrutinized the requirements that each of these applications places on broadband networks. As you can see from the table, different applications put entirely different demands on a network.

LEADING BROADBAND MULTIMEDIA APPLICATIONS

Application	Principal Task	Duration	Bandwidth Required
Enterprise Networks	Network Consolidation	Variable	
Residential Networks	Video Services	Periodic	
Community Networks	Distance Learning	Periodic	
Carrier Backbone	High Capacity Switching & Transport	Variable/ Periodic	

Handling these demands will take a portfolio of broadband products and technologies and an architecture that can pull it all together. That's why we developed a highly flexible distributed layered architecture that allows you to place switching and services where applications demand them.

Plan Ahead With Portfolio Of imedia Switches.

Then we made it a practical reality by designing not just one broadband multimedia switch, but several, each capable of a variety of tasks.

The result? Now you can build a broadband multimedia network of unprecedented flexibility and reliability with our Magellan portfolio of switches: Magellan Passport, Magellan Gateway and Magellan Concorde. So you can choose the switch that best fits your unique requirements.

Magellan Passport is our enterprise networking switch. It adds flexibility to networks by supporting multiple LAN and data protocols as well as voice and video, consolidating all your traffic on a single network.

Magellan Gateway is our network access switch. It offers cell-based services at a variety of access and trunking rates, utilizing a unique traffic and service management feature of our architecture called *Multiple Priority System*. Magellan Gateway optimizes network efficiency in real-time, based on the different types and priorities of traffic.

Our new Magellan Concorde offers the most sophisticated traffic-handling capabilities of any network transport switch. Optimized for SONET, it provides the high capacity required for backbone network applications.

So if you're headed into ATM, make sure you don't run into any surprises. Build your network from our portfolio of broadband multimedia switches, and you'll have the flexibility to handle your unique application requirements. Call 1-800-NORTHERN (press 1 and ask for extension 205).

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Circle Reader Service #23

While the others play follow-the-leader, we thought you'd like to know who they're following.

Funny thing. Seems like every time we talk to a potential customer about our ONline intelligent switching hub, the competition immediately starts discounting the price of their units.

The reason is obvious: Since Chipcom has consistently led the way in hub technology right from the beginning, what choice do the others have?

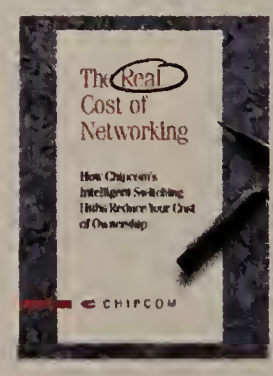
First with Fault-Tolerance. Chipcom has built fault-tolerance into all its networking hubs since 1988. Today, our ONline System Concentrator provides the industry's most complete fault-tolerant solution for large facility-wide networks, with features like backup power supplies, and Controller Modules, redundant links, backup concentrator configurations, self-healing network management and fault-tolerant transceivers.

First with Multiple Networks. When we introduced the TriChannel™ backplane, our biggest challenge was getting people to understand that now one hub could do the work of three or more, supporting up to 3 Ethernet, 7 Token Ring and 4 FDDI networks with integrated bridging and routing. Or to understand how much money it would save them on equipment purchase and operating costs.

First with Port-Switching. Armed with Port-Switching, a network manager can do moves, adds and changes, and can reassign any Ethernet port from one network to another with a couple of clicks of a mouse. And only Chipcom's ONdemand™ Network Control System lets you design an intelligent network that can reconfigure itself on the fly, do load-balancing on demand, and even troubleshoot itself. Without the ONdemand system and Port Switching, you get to make trips to the wiring closet to move cables. In fact, a lot of trips.

What does all this mean to you? It means that when you specify Chipcom, you're buying from a company that has always looked at networking differently. While the others were struggling with workgroup and departmental LANs, Chipcom hubs were running the huge manufacturing and financial networks of some of the largest companies, banks and universities in the world. Under conditions considerably tougher than any you're likely to encounter.

Does this mean that Chipcom costs more? Quite the contrary. A Chipcom network may actually cost less. And, over time, much less. In fact, with the savings you can realize just from eliminating closet-level moves, adds and changes alone, you can recoup the entire installation costs of your network in less than three years. To learn more, call **1-800-228-9930** and ask for your free copy of *"The Real Cost of Networking."* And learn more about the real economies of using Chipcom.



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Circle Reader Service #16

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Buyer's guide

Voice processors stand alone no more

Units dedicated to running single voice applications are giving way to multi-application processors.

BY MARC ROBINS

Benefiting from a lesson learned by their relatives in the data field, voice processing vendors are integrating applications that once ran on separate units under a single system umbrella.

Just as punch card tabulators and stand-alone word processors gave way to computers capable of running different types of applications, units once limited to offering only voice mail or interactive voice response (IVR) are being recast as multiapplication voice processors. These processors treat digitized voice as another form of data that can be stored, retrieved, sorted, indexed, copied, converted to different formats or played back as analog speech.

Processing digitized voice as chunks of data enables a mix of voice applications running on proprietary-, minicomputer- or personal computer-based platforms to share a common set of hardware resources. For instance, voice mail, automated attendant, audiotext and IVR applications can all make use of the same voice processing and carrier network interface boards as well as other peripherals such as host interface boards, hard disks and administrative consoles.

Some products use extra space in a private branch exchange chassis as a voice processing platform or use mainframes connected to a PBX to run voice processing applications.

Multiapplication voice processors also make it possible for users to gain increased functionality by purchasing add-on boards and software. This add-on capability paves the way for users to easily add emerging applications such as speech recognition that enables callers to enter commands by speaking them and text-to-speech technology that enables voice processors to read text files to callers.

Likewise, users can purchase add-on fax processing equipment that enables callers to use a telephone keypad to automate the sending and receiving of facsimile messages, initiate a fax broadcast or request a fax of a stored document.

On a related front, the emergence of unified messaging interfaces is paving the way for creation of voice processor-based mixed media mailboxes. Early implementations of unified messaging interfaces enable end users to get notification of new voice, electronic mail, fax messages from a telephone keypad or PC, as opposed to using a phone to get voice mail or a PC to pick up E-mail and checking a fax machine for incoming messages.

Unified messaging interfaces will also enable end users to enter commands on a telephone keypad or PC that redirect messages to an appropriate device for delivery. For instance, keypad commands can redirect fax messages to a nearby fax machine or E-mail messages to a text-to-speech board that will read the message to the end user (see story, page 58).

The emergence of multiapplication voice processors obviates the need for users to purchase stand-alone units that support separate applications. And studies from such research firms as Robins Press, Probe Research, Inc. and Frost & Sullivan Market Intelligence indicate users are indeed buying into the concept. For example, the studies show that while voice mail remains the most common voice processing application, it is increasingly being viewed as just one function of a much broader system platform.

With unified messaging interfaces now coming out, a multiplatform voice processor also paves the way for users to integrate all forms of messaging across the enterprise.

Key factors to consider in choosing a multiapplication voice processor are the system architecture and the breadth of applications the system can support.

Voice processors can be architected to run on a single platform in which individual processor boards are plugged into one or a series of interconnected buses and fall under the direction of a single operating system. Alternatively, a series of adjunct processors, each dedicated to running a single application, can be interconnected.

FROM HIGH TO LOW

Segmenting the voice processing market can be tricky. Most systems are designed for easy expansion, enabling low-end units to easily expand into the mid-range. Compounding the problem is the availability of networking schemes that allow multiple mid-range system chassis or even systems at remote sites to be strung together for even higher capacity.

In general, however, the very top of the market consists of units made exclusively for telephone companies and service bureaus. These systems sport proprietary, custom-made hardware that deliver anywhere from several hundred to more than 1,000 ports, much more capacity than large corporate users need. Products in this category often run from the hundreds of thousands to the millions of dollars and include Digital Sound Corp.'s Voiceserver, Octel Communications Corp.'s XC 1000 and Comverse Technology, Inc.'s Trilogue Infinity.

Large corporate users will find systems in the high-end to mid-range market better suited to meet their needs. Most systems in this market segment are built on top of proprietary hardware platforms, while a few make use of minicomputers. Systems falling into this end of the market include Octel's Aspen, AT&T Global Business Communication Systems'

Continued on page 58

1994 NETWORK WORLD SHORT LIST

Voice processing systems

- **AT&T Global Business Communication Systems** *Ovation and Conversant families*
- **Centigram Communications Corp.** *Adaptive Information Processing Platform*
- **Octel Communications Corp.** *Voice processing product family*
- **VMX, Inc.** *VMX 200 and VMX 300*

Complete details about The Short List appear on page 63.

INSIDE

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Sales and Service Worldwide

Circle Reader Service #24

Continued from page 54

Ovation Voice Processing System and Conversant Voice Information System, Centigram Communications Corp.'s Adaptive Information Processing Platform and VMX, Inc.'s VMX 200 and VMX 300. They routinely support as many as 100 ports and a robust feature set similar to what is available on top-end systems.

High-end to mid-range products support a variety of vendor-provided hardware and application software modules, such as fax broadcasting and E-mail integration packages. Also offered are families of vertical and horizontal market applications that address specific business needs, such as an IVR program for bank account inquiry or a network help desk package. To help customize the programming of the systems' various features, system-specific application generators are also thrown into the pot.

Application generators are highly structured, menu-driven programs that enable users to create new or customize existing voice processing applications. They typically offer help menus, pull-down windows, a mouse and other programming aids and conveniences.

Products built on top of a proprietary platform are designed to seamlessly work within a telephony environment and support continuous operation, often providing more than 99% uptime and the ability to automatically restart themselves after a failure. Proprietary platforms are also built with multiple buses to provide for easy growth and support hot swappable parts, which enables users to change out failed boards for new ones without taking the system down.

Currently at the low-end of the market are systems based predominately on industry-standard, open-architected PC platforms supporting as many as 36 ports. While not yet as powerful as existing high-end to mid-range systems, PC platforms are quickly becoming the preferred choice.

Indeed, with new PCs continuously breaking benchmark records, the sheer processing power unleashed by the new generation of Intel Corp. 80486 and Pentium-based PCs is providing the most cost-effective platform for sophisticated voice applications. And that power will only increase as such new chips as the PowerPC developed by Apple Computer, Inc., IBM and Motorola, Inc., as well as Digital Equipment Corp.'s Alpha, gain a foothold in the market.

A majority of vendors already offer PC-based products. The sheer economy of PC technology along with availability of such components as voice boards — the heart of any voice processor — from several third-party suppliers is encouraging a steady crop of new vendors to enter the marketplace. Even end users are getting in on the act and building their own PC-based voice processors (see story, page 64).

ARCHITECTURES

Products built on top of proprietary platforms fall into one of two broad architectural camps: one enables all components to be plugged into a single platform; the other calls for a series of application specific systems — called adjunct processors — to be tethered to a central system unit.

VMX, Digital Sound and AT&T use the single platform approach, while Octel, Active Voice Corp. and Northern Telecom, Inc. have taken the adjunct processor route.

In the single platform approach, specialized circuit boards are plugged into a bus. Incoming calls received by network interface boards are passed off to voice boards, which digitize voice. Application programs such as voice mail or automated attendant then direct the digitized voice to peripherals needed to process the call. These products can be programmed to work with such stand-alone third-party systems as fax servers, but the trend among vendors is to build everything themselves and meld it into their voice processors.

Why voice mail makes sense

Of all those little pink slips:

90%	contain incomplete information.
46%	contain only caller's name and phone number.
26%	contain caller's name and call's purpose but no phone number.
10%	contain only caller's name.
10%	contain complete messages.

SOURCE: ROBINS PRESS, RIVERDALE, N.Y.

Moving to unified messaging

The day when an end user can retrieve voice mail, electronic mail and facsimile messages using a telephone or personal computer has dawned. No longer do users have to pick up the phone to get voice mail, tap out commands on a PC keyboard to look at E-mail and go to the fax machine to check for incoming documents.

Some products already on the market, such as boards that support voice messaging and fax, make it possible for users to receive multiple types of messages on a PC by toggling between applications. But development of a unified messaging interface for voice processors will enable users to control different messaging applications from a single user interface.

Unified messaging is taking two distinct forms.

The first method, offered by VMX, Inc. and others, uses a mixed-media mailbox that lets users dial in to a system and receive notification of waiting voice, fax and E-mail messages over their phones. Callers can then direct a fax message to the nearest fax machine and have an E-mail message read back to them if the voice processor supports a text-to-speech technology.

A second approach currently under development involves using a PC-based Windows interface to present various messaging types in an integrated point-and-click package. Vendors with beta versions of such an interface include Active Voice Corp., Applied Voice Technology, Inc., Octel Communications Corp. and VMX.

Unified messaging is getting a further boost from Microsoft Corp. and its At Work Architecture. The At Work Architecture is essentially a set of software building blocks that resides in both office machines and PC products, including desktop- and network-connected printers, digital monochrome and color copiers, telephones and voice processing systems, fax machines, PC-based fax products and personal digital assistants.

Dialogic Corp., a lead supplier of PC-based voice boards, fully supports the At Work Architecture and believes Microsoft's backing of voice and call processing technology will spur demand for local-area network-based unified messaging and integrated voice applications.

According to John Landau, vice president of Marketing at Dialogic, these voice processing servers are critical to the development of integrated computer and telephone applications because they are connected to a customer's private branch exchange, creating a bridge between the telephone network and the LANs that link individual users' PCs.

"A standard voice processing server architecture enables users of existing desktop hardware to benefit from unified messaging as an extension of individual communications tools and capabilities like voice mail, fax or E-mail," says Landau. "Local and remote users have one interface to access and process multimedia messages as well as convert messages into a preferred form, such as converting fax to text and/or text to speech."

A number of voice processing system vendors have developed Windows-based unified messaging server products that allow users to visually display, access and manage voice and fax messages from a PC. These include products such as Active Voice's TeLANophy and Applied Voice's CallXpress 3 Desktop.

Other voice processing companies dabbling with a Windows interface include VMX and Octel Communications. VMX is developing its VMXmail software product, a client/server voice messaging program that can be integrated into two popular LAN-based E-mail applications — the Windows version of Lotus Development Corp.'s cc:Mail and Microsoft's Microsoft Mail. Octel is also developing a Windows-based unified messaging product that allows users to display, access and manage voice and fax messages from a PC.

M. Robins

Voice processing system vendors are adding speech recognition and text-to-speech technology to their products by licensing the necessary hardware and software from a number of vendors.

Speech recognition technology is licensed from:

- ***Voice Processing Corp. of Cambridge, Mass.***
- ***Scott Instruments of Denton, Texas***
- ***Lernout and Hauspie Speech Products of Woburn, Mass.***
- ***Emerson and Stern Associates, Inc. of San Diego***

Text-to-speech technology — also known as speech synthesis — is licenced from:

- ***Berkeley Speech Technologies, Inc. of Berkeley, Calif.***
- ***Kurzweil Applied Intelligence, Inc. of Waltham, Mass.***

With an adjunct processor architecture, calls are received by a central unit, which then shuttles requests for information or application processing services across point-to-point links to processors designed to perform specific functions.

The single system architecture is better suited to support the emerging unified messaging concept because hardware resources and applications can be more tightly integrated if they are maintained under one roof. Systems built on top of the adjunct processor architecture can also support unified messaging but at the cost of more intricate, complicated programming than is required in a single platform architecture.

In the PC-based arena, products are typically offered from a single system platform. However, utilizing local-area network technology, a series of PC-based voice systems can be strung together to work in a client/server environment. Increasingly, applications running on one voice server are being designed to request services running on any other server on the LAN, including fax servers.

Some vendors offer networking features that link multiple voice processors at the same site or across remote sites. Networking features make it possible for voice messages to be forwarded among interconnected systems.

Voice processors across market segments provide a link to a company's PBX or Centrex service. Such a link enables message-waiting notifications to be passed from the voice processor to a user's extension and enables callers to return to an operator or dial another extension during a single phone call.

VOICE BOARDS

Aside from the architecture, a key factor to consider in choosing hardware is the type of voice board supported. While there is little difference in functionality among voice boards, there is a difference in who builds the boards and how they were built.

Vendors of high-end to mid-range products generally manufacture their own voice boards and all other components — everything from telephone network interface boards to operating systems and disk drives. These vendors often distribute voice board functionality across a multiboard set.

Creating multiboard sets gives proprietary voice board makers the benefit of putting physical network interfaces, tone detection circuitry, voice digitization and other functions on dedicated boards. This paves the way to have boards with, for example, very high-port density or random-access memory buffers that are optimized to perform specific functions such as retrieving stored voice from a disk as quickly as possible. It also makes for high reliability because the failure of one board will not bring the entire system down.

PC-based systems utilize third-party voice boards made by such companies as Dialogic Corp., Natural MicroSystems Corp. and Rhe-

Continued on page 63

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PremNet: The Fiber Optic Superhighway For All Your Voice, Video And Data Traffic.

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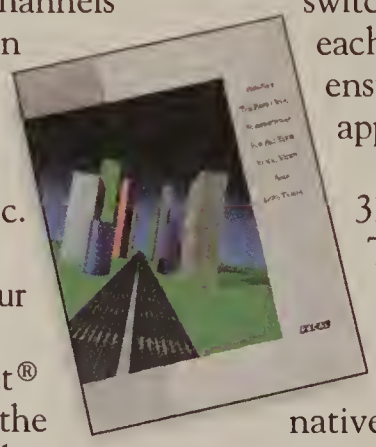

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RACAL

Voice processing systems (continued on page 61)

Company	Product	Platform	Software operating environment	Number of ports (min./max. where given)	Voice board used	Voice mail features				Automated attendant features	IVR host interface support						IVR features	Fax board used	Fax processing	Additional features				Price
		M = Minicomputer PB = Proprietary P = PC O = Other	D = DOS OS = OS/2 U = Unix V = VMS O = Other		D = Dialogic N = Natural Microsystems P = Proprietary R = Rhetorex O = Other	Max. networked systems	Min./max. mail boxes	Max. hours of voice storage	AMIS standard support	C = Call screening D = Dial zero for operator O = On-line directory	Asynchronous RS-232	IBM 3174/3274 emulation	LAN interface	IBM 327X terminal emulation	IBM 525X terminal emulation	VT 100/200 terminal emulation	A = Auto logon/logoff AR = Auto recovery H = Host computer down alarm K = Keep-alive support	B = Brooktrout G = Gammalink BI = Biscom S = Spectrafax D = DCE O = Other	FB = Fax broadcasting FM = Fax mail FOD = Fax on demand	Application generator	Rotary phone support	Mixed-media mailbox support	Windows interface support	
Active Voice Corp. (206) 441-4700	Replay Voice Processing System	P	D	2/6	D		1/100	6.5	✔	D, O											✔			$5,000-$15,000
	Repartee Voice Processing System	P	D, OS	2/36	D	65,536	1/65,000	90	✔	C, D, O							A, AR	G	FM, FOD		✔	✔	✔	$9,000-$80,000
Advanced Voice Technologies, Inc. (800) 237-3914	Messenger	P	D	2/24	D					C, D, O										✔	✔			$6,700-$82,000
American Voice Mail, Inc. (216) 394-4155	Call Plus	PB	U, O	1/32	P				✔	C, D, O	✔						A, AR, H, K					✔		$9,500-$60,000
APEX Voice Communications, Inc. (818) 379-8400	OmniVox	P	U	64	D	2/50+	2/20,000+	200+		C, D, O	✔	✔	✔	✔	✔	✔	A, AR, H, K	B, O	FB, FM, FOD	✔	✔	✔	✔	$9,100
Applied Voice Technology, Inc. (206) 820-6000	Automated Agent	O	OS	4/64	D	18,000	1/1m	490	✔		✔	✔	✔	✔		✔	A, AR, H, K	B	FB, FM, FOD (1)	(1)				$20,000-$100,000
	CallXpress3	O	OS	4/64	D	18,000	1/1m	490	✔	C, D, O								B		✔	(1)	✔	✔	$10,000-$100,000
Arkansas Systems, Inc. (501) 227-8471	Tele-Banking	M, P	D, OS, O	NA	D				✔	C, D, O	✔	✔	✔	✔	✔		A, AR, H, K	O		✔	✔		(1)	$20,000-$110,000
AT&S (803) 750-7279	Voice Magic	P	D	4/24	O		1/10,000	60		C, D, O	✔	✔	✔				A, AR, K	O	FOD	(1)	✔	✔		$8,000-$40,000
AT&T Global Business Communication Systems (800) 325-7466	AT&T Ovation Voice Processing System	O	O	4/1,920	P		1/500,000	28,800	✔	D								O	FB, FM, FOD	(1)	✔	✔		$26,000-$331,200
	AT&T Definity Audix System	PB	U	16	P		1/2,000	40	✔	D, O										✔	✔			$17,000-$90,000
	Audix Voice Messaging System	PB	U	32	P	100	1/4,000	520	✔	D, O										✔	✔			$28,000-$200,000
	Conversant Voice Information System	P	U	4/96	P		1/300	36		D, O	✔	✔	✔	✔	✔	✔	AR, H	B	FB, FM, FOD	(1)	✔	✔		$13,000-$38,500
	Integrated Solutions III	P	U	4/12	P		1/300	36		D, O								B	FB, FM, FOD		✔	✔		$12,000-$40,000
	Merlin Mail	P	O	2/4	P					D, O								B			✔			$5,500-$7,450
	Partner Mail	P	O	2/4	P					D, O								B			✔			$5,500-$7,450
	Partner Mail VS	P								D											✔			$1,750-$2,750
Centigram Communications Corp. (408) 944-0250	Adaptive Information Processing Platform	O	U	4/112	P	1,500	1/130,000	960	✔	C, D, O	✔	✔	✔	✔	✔	✔	A, AR, H, K	B	FB, FM, FOD	✔	✔	✔	✔	$10,000-$500,000
Cobotyx Corporation, Inc. (800) 288-6342	Secretary	O	O	2/16	D, P, R, O		1/500	16	✔	C, D, O										✔	✔			$3,980-$18,340
Cognitronics Corp. (203) 830-3546	McIAS 3000	PB	U	8/192	P						✔	✔	✔	✔	✔	✔	A, AR, H, K	O		(1)				$55,595+
	Dacon Pacer	PB	D	4/8	P					C, D, O											✔			$4,995
	Dacon Protocol	PB	D	2/8	R		1/800	8		C, D, O											✔			$8,500-$10,500
Comdial Corp. (800) 347-1432	Execumail	P	D	2/16	D				✔	C, D, O														$3,200-$12,000
Computer Communication Specialists, Inc. (404) 441-3114	FirstLine	P	D, O	4/1,000	P	20		10		C, D, O	✔	✔	✔	✔	✔	✔	A, AR, H, K	O	FB, FM, FOD	✔	✔			$10,000+
Comverse Technologies, Inc. (800) 967-1029	Trilogue Infinity	PB	O	4/1,920	P	989	1/500,000	30,000	✔	C, D	✔	✔	✔	✔	✔	✔	A, AR, H, K	O	FB, FM, FOD	(1)	✔	✔		$20,000-$10m
Cortelco, Inc. (901) 365-7774	SDI Series 2000 Voice Processing System	P	OS	4/24	N		1/10,000	30		C, D, O								O	FM, FOD			✔		$11,000-$40,000
DAC Systems (203) 924-7000	SMC 2000, 3000, 4000	P	D, OS, U	1,920	D	10	1/100,000	800		C, D, O	✔	✔	✔	✔	✔	✔	A, AR, H, K	G, O	FB, FM, FOD	(1)	(1)			$5,000-$100,000
Digital Sound Corp. (805) 566-2000	Voiceserver	M	U	8/240	P	200	3,000/50,000	1,400	✔	D, O	✔	✔	✔			✔	A, AR, H, K	O	FM	(1)	✔	✔		$40,000-$750,000
Digital Speech Systems, Inc. (214) 235-2999, Ext. 110	TMX 32/5000	P	D	4/60	D, R		1/5,000	65	✔	C, D, O	✔	✔	✔	✔	✔	✔	A, AR, H, K	O	FB, FOD	(1)	✔	✔		$13,000+
	TMX 12/500	P	D	2/12	D, R		1/500	11	✔	C, D, O	✔	✔	✔	✔	✔	✔	A, AR, H, K	O	FB, FOD	(1)	✔	✔		$7,900-$20,000

Products highlighted by color were selected for The Short List.

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VR = Interactive voice response
NA = Not applicable

FOOTNOTE:
(1) Supplied as optional add-on product.

Chart compiled by Cheri Paquet

Voice processing systems (continued on page 63)

Company	Product	Platform (M = Minicomputer, PB = Proprietary, P = PC, O = Other)	Software operating environment (D = DOS, OS = OS/2, U = Unix, V = VMS, O = Other)	Number of ports (min./max. where given)	Voice board used (D = Dialogic, N = Natural Microsystems, P = Proprietary, R = Rhetorex, O = Other)	Voice mail features: Max. networked systems	Voice mail features: Min./max. mail boxes	Voice mail features: Max. hours of voice storage	Voice mail features: AMIS standard support	Automated attendant features (C = Call screening, D = Dial zero for operator, O = On-line directory)	IVR host interface support: Asynchronous RS-232	IVR host interface support: IBM 3174/3274 emulation	IVR host interface support: LAN interface	IVR host interface support: IBM 327X terminal emulation	IVR host interface support: IBM 525X terminal emulation	IVR host interface support: VT 100/200 terminal emulation	IVR features (A = Auto logon/logoff, AR = Auto recovery, H = Host computer down alarm, K = Keep-alive support)	Fax board used (B = Brooktrout, BI = Biscom, G = Gammalink, S = Spectrafax, O = Other, D = DCE)	Fax processing (FB = Fax broadcasting, FM = Fax mail, FOD = Fax on demand)	Additional features: Application generator	Additional features: Rotary phone support	Additional features: Mixed-media mailbox support	Additional features: Windows interface support	Price
	Univoice 100	P	D	2/8	D, R		1/100	11	✔	C, D, O								O			✔			$5,650-$11,800
DuVoice Corp. (206) 821-9228	Frontdesk	P	D	24	D, R	4	1/10,000	50		D, O	✔		✔			✔	H	O	FB, FM, FOD		✔	✔		$2,500-$25,000
Electronic Tele-Communications, Inc. (404) 457-5600	MAX Receptionist	P	D	8/36	D	50	1/65,000	40	✔	C, D, O														$19,400-$61,995
	MAX Receptionist Jr.	P	D	4/8	D	50	1/65,000	9	✔	C, D, O														$10,545-$16,000
Glenare Electronics, Inc. (800) 866-4002	Modular Voice Processing System	M	O	4/1,000	P	8	1,000/50,000	1,000	✔	C, D	✔			✔		✔	A, AR, H, K	B	FM, FB, FOD	(1)	✔	✔		$20,000-$900,000+
Granada Systems Design, Inc. (800) 472-6444	TeleSwift-Plus	P	U	4/16	D	16	1/999	120		D, O											✔			$20,000
	GranVision	P	U	4	D						✔	✔	✔			✔	A, AR, H, K	O	FB, FOD	✔	✔			$20,000-$64,000
	TelDear	P	D	4/32	D							✔	✓		✔	✔	A, AR, H, K			✔	✔			$17,800-$51,000
	TeleSwift	P	D	4/32	D		1/999	100		C, D, O										✔	✔		(1)	$4,995-$32,000
Harris Corp. Digital Telephone Systems Division (800) 888-3763	Calleaque	P	D	2/36	D	56	1/10,000	690	✔	C, D, O								G	FM, FOD					$8,500-$60,400
HNS Enterprises (215) 966-3515	Maverick Mail	P	O	2/24	D, R		1/500	150		C, D, O								O	FM, FOD		✔	✔		$3,500-$30,000
HOMISCO, Inc. (617) 665-1997	HVMS	P	D, OS, U	2/480	D, N	64	1/20,000	3,000	✔	C, D, O	✔	✔	✔	✔	✔	✔	A, AR, H, K	O	FB, FM, FOD	(1)	✔	✔	✔	$5,000-$250,000
International Business Machines Corp. (800) 426-4211	CallPath DirectTalk/6000	O	O	12/96	P	100		1,500		C, D, O	✔	✔	✔	✔			A, AR, H, K	O	FB, FM, FOD	✔	✔		✔	$20,000-$250,000
	CallPath DirectTalk/2	P	OS	4/24	D	100		400		C, D, O	✔	✔	✔	✔	✔		A, AR, H, K	O	FB, FM, FOD	✔	✔			$10,000-$70,000
MacroVoice Corp. (407) 994-9781	MVX Series 100, 200	P	D	2/24	R		1/25,000	33		C, D, O	✔							O	FOD	✔	✔			$4,000-$25,000
Melita International Corp. (800) 635-4821	Phone Frame Universal Switch	P	D, OS, U, O	512	D						✔	✔	✔	✔	✔	✔	A, K							$84,000-$2m
Microlog Corp. (301) 428-9100	VSC 3500	P	D	4/48	D	32	1/3,500	50		D, O	✔	✔	✔	✔	✔	✔	A, AR, H, K	B, G	FB, FOD	✔	✔			$10,000-$250,000
Microvoice (805) 642-0202	Apex	PB	O	4/128	P	8		.5		D, O	✔	✔	✔	✔	✔	✔	A, AR, H, K			(1)	✔		✔	$5,000-$15,000
Northern Telecom, Inc. (800) 667-8476	Meridian Mail	PB	O	4/192	P	50	1/42	1,200	✔	D, O	✔	✔	✔	✔			A, AR, H	O	FB, FM, FOD			✔	✔	$8,000-$780,000
Octel Communications Corp. (408) 321-2000	Voice processing product family	PB	O	2/144	P	500	1/30,000	672	✔	D		✔	✔	✔			A, AR, H, K	B	FB, FM, FOD	✔	✔	✔		$15,000-$1m
Parwan Electronics Corp. (908) 536-7500, Ext. 108	Call Connect	P	D, OS, U	3/21	D, R					C, D, O	✔						A, K	G	FOD	✔	✔	✔		$35,000
	DialSaver, VoiceSaver	P	D, OS, U	2/32	D, R		1,000/16,000	400	✔		✔							G	FOD	✔		✔		$300/port
Perception Technology (617) 821-0320, Ext. 213	Vocom V	M, O	V	24/500+	P					C, D, O	✔	✔	✔	✔		✔	A, AR, H, K	BI, D, S, O	FOD	✔	✔			$89,900
	Vocom 40, 6000	M, O	U, O	8/500	P					C, D, O	✔	✔	✔	✔	✔	✔	A, AR, H, K	BI, D, S, O	FB, FOD	✔	✔			$50,000-$100,000+
Periphonics Corp. (516) 467-0500	VPS Series	PB	U	4/240	P						✔	✔	✔	✔	✔	✔	A, AR, H, K		FB, FOD	✔	✔			$35,000-$150,000
Rolm (408) 492-2995	PhoneMail	PB	O	128	P	50	1/32,000	762	✔	D, O								S						$29,400+
Soft-Com, Inc. (212) 242-9595	Diplomat	P	D	32	D		1/2,000	100		C, D, O														$10,000-$50,000
Streetwise Systems, Inc. (800) 929-5553	Personal Secretary	P	OS	4/24	R	256	1/1,200	100		C, D, O	✔	✔	✔	✔	✔	✔	A, AR, H, K	G, O	FM, FOD	✔		✔	✔	$4,995
Syntellect, Inc. (602) 789-2800	Premier 030	PB	D	4/72	P	100		5			✔	✔	✔	✔	✔	✔	A, AR, H, K	O	FOD	✔	✔			$24,000-$156,000
	Vocal Point	P	OS	4/24	D	16	1/8,000	100		D, O	✔	✔	✔		✔	✔	A, AR, H, K	G	FB, FOD	✔	✔			$16,800-$50,000
	Dytel Call Center Gateway	PB	O	4/96	P		1/10,000	240	✔	C, D, O										✔				$17,000+
T1 Systems, Inc. (303) 234-9000	Call Processing Platform	P	D, U	4/1,000+	D	45+	1/10,000	350+	✔	C, D, O	✔	✔	✔	✔	✔		A, AR, H, K	B, BI, G, O	FB, FM, FOD	(1)	✔	✔		$10,000-$100,000+
TALX Corp. (314) 434-0040	TALX System	O	OS	48	O					D	✔	✔	✔	✔		✔	A, AR, H, K	O	FB, FM, FOD	(1)		✔		$30,000+

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VR = Interactive voice response
NA = Not applicable

FOOTNOTE:
(1) Supplied as optional add-on product.

Chart compiled by Cheri Paquet

We'll save you from foreign bureaucracy.

PTT Setting up an overseas communications network shouldn't be a communications challenge in itself. That's why, at Swiss Telecom, we're cutting the red tape and rolling out the red carpet for our North American customers.

Our North American office has been set up to make it easy for you to communicate with people at the PTT. And in Switzerland, one of the world's most modern telecommunications infrastructures enables you to communicate with a full menu of services to locations throughout the country.

When you locate your hub at the crossroads of Europe you get not only the highest quality digital links to all major European business centers. You also get the best service: your circuit performance is closely monitored around the clock by English-speaking specialists at our Leaseline Control Center in Berne.

Managing an overseas network can be overwhelming. If you want to avoid getting stuck with a carrier that cares more about policies and procedures than people, consider us. Contact Tom Lamoureux, Swiss Telecom, N.A., Suite 600, 2001 L St. N.W., Washington, D.C. 20036. 1-800-966-1145.

SwissTelecom

Voice processing systems (continued from page 61)

Company	Product	Platform (M = Minicomputer, PB = Proprietary, P = PC, O = Other)	Software operating environment (D = DOS, OS = OS/2, U = Unix, V = VMS, O = Other)	Number of ports (min./max. where given)	Voice board used (D = Dialogic, N = Natural Microsystems, P = Proprietary, R = Rhetorex, O = Other)	Voice mail features: Max. networked systems	Voice mail features: Min./max. mail boxes	Voice mail features: Max. hours of voice storage	Voice mail features: AMIS standard support	Automated attendant features (C = Call screening, D = Dial zero for operator, O = On-line directory)	IVR host interface support: Asynchronous RS-232	IVR host interface support: IBM 3174/3274 emulation	IVR host interface support: LAN interface	IVR host interface support: IBM 327X terminal emulation	IVR host interface support: IBM 525X terminal emulation	IVR host interface support: VT 100/200 terminal emulation	IVR features (A = Auto logon/logoff, AR = Auto recovery, H = Host computer down alarm, K = Keep-alive support)	Fax board used (B = Brooktrout, Bi = Biscom, G = Gammalink, S = Spectrafax, O = Other, D = DCE)	Fax processing (FB = Fax broadcasting, FM = Fax mail, FOD = Fax on demand)	Additional features: Application generator	Additional features: Rotary phone support	Additional features: Mixed-media mailbox support	Additional features: Windows interface support	Price
TEC International (800) 793-9283	VIC	P	D	4/36	D		1/ 100,000	1,400		C, D, O							AR							$8,000-$85,000
TeleVoice, Inc. (713) 497-8000	HOSTLink	P	D	4/32	D					D	✔	✔		✔	✔	✔	A, AR, H, K		FB, FOD	✔	✔			$5,950-$11,950
Telrad Telecommunications (800) 639-7463	I.V.M.	P	D	2/12	P	4	1/1,000	10	✔	C, D, O									FOD		✔			$5,000
VMX, Inc. (800) 284-4869	VMX 100, 200, 300	P	O	2/96		500	1/ 10,000	550	✔	D, O	✔	✔	✔	✔	✔	✔	A, AR, H, K		FB, FM, FOD		✔	✔	✔	$17,000-$650,000
VoiceNet, Inc. (617) 665-1997	VN-1000	P	D, OS, U	4/240	D, N	6	100/ 25,000	250	✔	C, D, O	✔		✔	✔	✔			O		(1)	✔			$7,395-$9,495
Voice Systems Technology (609) 751-9100	Enhanced Messaging and Fax	P	D	4/3,800	D		50+	500+		D, O								O	FB, FM, FOD	✔		✔		$11,995-$250,000+
	SuperMail Business System	P	D	4/12	D		20/250	50		D, O								O	FB, FM, FOD	✔		✔		$8,995-$20,995

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FOOTNOTE:
(1) Supplied as optional add-on product.

Chart compiled by Cheri Paquet

Continued from page 58

torex, Inc. These products integrate most basic functions and some advanced functions on a single board. Dialogic provides boards with 4, 8, 16 or 24 ports.

Rhetorex, which was recently purchased by VMX, has 2-, 4- and 24-port boards, while Natural MicroSystems has 2-, 4-, 8-, 16-, 24-, 30-, 48- and 60-port boards.

PC-based boards are also designed to published specifications, which enables providers of fax, speech recognition, text-to-speech and other boards to make interoperable products. Third-party voice boards also work across PC expansion buses, which are created by plugging the boards into a standard PC bus and interconnecting them via a ribbon cable. Expansion buses speed the flow of traffic among voice processor boards.

Dialogic, which accounts for about 75% of the third-party voice board market, currently uses its PCM Expansion Bus (PEB) to interconnect voice processing boards.

The PEB is a time-division multiplexing bus that can support as many as 32 full-duplex calls simultaneously. The firm is developing its Signal Computing System Architecture (SCSA) bus that will increase call-handling capacity and provide the amount of bandwidth needed to support such up-and-coming applications as video messaging.

While it is unclear when the SCSA will be available, Dialogic will pit it against Natural MicroSystems' Alliance Generation bus, which supports boards with 60 ports. Alliance Generation is a follow-on to Natural MicroSystems' Multivendor Integration Protocol (MVIP) bus, which supports a PBX-like switching architecture capable of handling as many as 256 full-duplex calls simultaneously. Alliance Generation will also support the lower density port boards used with MVIP.

APPLICATION PROCESSING

Evaluating the hardware choices, while important, is only half the battle. An examination of the system and application software is just as critical.

Operation of all high-end products is controlled by proprietary, multitasking operating systems, usually based on Unix. PC-based platforms use industry standard operating sys-

The Short List:

Voice processing systems

The Short List highlights products Network World *recommends you examine during the purchase process for multiapplication voice processing systems. Vendors included on The Short List were selected based on their ability to provide systems that deliver multiple applications, such as voice mail, voice response and fax processing. Some also offer other important features, such as unified messaging capabilities. These criteria reflect the needs of users with multivendor enterprise networks. Your criteria may differ based on network configuration and application needs.*

■AT&T Global Business Communication Systems
Ovation Voice Processing System and Conversant Voice information families

AT&T's Ovation Voice Information System family provides a robust mix of voice mail, call processing and fax mail applications on a single platform. Each system mailbox can contain voice, fax and combined voice messages, and a single set of commands can be used to access all types of messages in a single call.

The Ovation 2000, designed for small- to medium-sized companies, supports up to 16 ports and 32,000 mailboxes. The Ovation 6000 can handle up to 64 ports and 59,000 pages of fax storage. The line ranges in price from $26,000 to $331,000.

AT&T's Conversant Voice Information System product family offers a full range of voice and fax processing applications, including voice response, voice mail, fax-on-demand, speech recognition and text-to-speech. Models in the family include the low-end Intro Version with up to 12-ports and scale up to the Multi Application Processor (MAP)/100C with up to 96 ports. Prices range from $13,000 to $38,500.

■Centigram Communications Corp.
Adaptive Information Processing Platform

This product supports voice mail, voice response and fax processing including fax-on-demand and text-to-speech applications on a single platform. The system can support up to 112 ports, providing up to 130,000 mailboxes and 960 hours of voice storage. The system can also support up to eight IBM Systems Network Architecture host and 64 asynchronous host links for voice response applications, and features mixed-media mailboxes and a unified messaging interface product. Prices range from $10,000 to $500,000.

■Octel Communications Corp.
Voice processing product family

Octel's product family includes several different models and scales very well from low- to high-end. Built on proprietary hardware, the firm's top of the line model, the XC 1000, supports 48 to 144 ports. Also based on proprietary hardware, models in the Maxum line can handle 16 to 72 ports, while the Aspen system has up to 24 ports, and the Branch line supports up to 16 ports. At the low end, the firm's PC-based VPC 100 supports up to eight ports.

Product-line capabilities include telephone answering, call processing, voice mail, automated attendant, audiotext, interactive voice response, fax processing, networking and integration with virtually all major brands of PBXs and Centrex systems. Octel recently introduced its Voice Information Processing Server (VIPS), which consists of voice and data processing modules that communicate through Octel's Command Language over X.25 links as well as its PowerCall Session, a collection of voice processing applications. VIPS enables Branch, Aspen, Maxum and XC 1000 systems to support a strong mix of applications, including interactive voice response and fax processing.

Octel also provides its TransAct software, a proprietary application generator package that enables users to custom-tailor PowerCall Session applications. Octel systems range in price from $15,000 to over $1 million.

■VMX, Inc.
VMX 200 and VMX 300

These integrated voice processing systems provide strong automated attendant and voice mail applications. With the addition of VMXworks software and associated add-on hardware, the systems can provide additional capabilities such as voice response, fax processing and E-mail integration. The VMX 200 and VMX 300 can be configured from four to 96 ports and can support up to 8,000 users per cabinet. Additional features on the VMX 200 and 300 include mixed-media mailboxes and a PC-based unified messaging interface. Prices start at $17,000 and run to $650,000.

Building your own

Manufacturers do it. Value-added resellers do it. Systems integrators do it. And, yes, now end users are doing it too. Building their own voice processors that is.

The incredible sophistication, ease of use and quality of new voice processing software and hardware components have made it possible for personal computer-literate users to build their own systems from the ground up. For the price of an Intel Corp. 80486 PC, a four-port voice board and a software development tool kit or application generator, users can build a fairly robust voice processor for about $5,000 to $7,000.

The PC is the core building block. Voice processing add-on boards and software will make use of its random-access memory, floppy and hard disk drives, power supply and bus.

There are a number of other voice processing building blocks including voice boards made by such companies as Dialogic Corp., Natural MicroSystems, Corp. and Rhetorex, Inc., as well as a number of software programs necessary for configuring and controlling the system and creating user-ready applications.

Sometimes referred to as audioboards, voice boards provide the circuitry for processing voice and other analog signals into a digital format. These boards also provide the essential interfaces needed to connect to the telephone network and other peripheral devices.

Generally, voice boards include an on-board CPU, circuitry for detecting dual-tone multi-frequency signals generated by push-button phones and specialized chips for converting between analog and digital voice. These boards also have memory chips for storing and running software routines, chips for data storage, Federal Communications Commission approved telephone line interfaces for connecting to phone lines and an interface for connecting to the PC's bus.

For users swayed in the direction of building their own voice processor, there are a number of important considerations to understand when selecting the PC platform.

It's important to know which type of bus the selected PC supports. To a large extent, the type of bus will drive what type of voice board will be used. Some board vendors have products for IBM PC/XT 8-bit buses and IBM AT 16-bit buses. Others make boards for only one type of bus. A few vendors also have cards for IBM's MicroChannel and 32-bit Extended Industry Standard Architecture bus. The benefit of using a 16- or 32-bit bus, as opposed to an 8-bit bus, is greater system throughput, and higher system capacity and performance.

It may sound simple, but the selected PC bus should provide a number of expansion slots. The number of free slots will determine how many voice boards the PC can support and, hence, total port capacity. Slots should also be left open for add-on boards such as a video board, network interface board, fax board and speech recognition board.

When it comes to the processing demands of voice applications, the more powerful the PC's processor, the better for overall system performance. The power of PC processors continues to increase with Intel's 80486 and its new Pentium, enabling PCs to rival the power of low-end workstations and minicomputers.

Just as important as the PC bus and processor is the operating system. Voice boards include drivers that let them work with various operating systems. Multitasking operating systems such as Unix or OS/2 are ideal for voice processors, especially for those with 24 ports or more.

Lastly, the PC needs to support high-capacity and high-speed disk drives. Voice processing applications constantly read and write data from and to the disk. Therefore, when choosing a hard disk, look for a fast Integrated Drive Electronics (IDE) or Enhanced Small Device Interface drive that has an access time of 17 milliseconds — 11 or 13 milliseconds is even better.

To determine how much storage is needed, take into account such thing as how many minutes of voice storage per megabyte of disk space is supported. This minutes-to-megabyte measurement will depend on the efficiency of the digitization algorithm used by the voice board. Also important in gauging disk size is the number of voice ports the drive will support, how many applications the voice processors will run and how many callers will be supported.

M. Robins

tems such as DOS, OS/2 and Unix. As a rule of thumb, network managers should choose a multitasking operating system for obvious reasons.

The operating system orchestrates the execution of such applications as voice mail, automated attendant and IVR. Vendors are now adding fax processing and E-mail integration applications to the mix.

In today's market, it's hard to tell one voice-mail application from another, especially at the high end of the market where feature sets are robust. The majority of voice processing vendors got their start in voice mail and continue to offer important features. In particular, they offer on-line directories that enable callers to enter telephone keypad commands to look up someone's extension or return to an operator. They also enable callers to mark messages as urgent or priority and support various outdialing options, such as calling a message recipient's pager when a new message is left.

Some low-end products do not provide as full a feature set, largely because their vendors have choosen not to program them into the application. Essentially, users choosing these low-end products give up such robust features as urgent message marking and outdialing.

There is likewise not much difference in automated attendant applications, which automatically answer incoming calls and ask callers to use a telephone keypad to enter the extension number of the party they wish to reach or the number for another voice processing application.

Dytel Corp.'s Call Center Product pioneered the high-end to mid-range market for automated attendants and was recently purchased by Syntellect, Inc. Cobotyx Corp., Inc. also got its start in the automated attendant market and continues to offer a robust product.

High-end automated attendant applications provide two important functions: call screening and an on-line directory.

With call screening, the automated attendant asks callers to speak their names before transferring the call to the desired extension and records those names. When the call is transferred, the called party can hear who is calling and can decide to take the call or not. Calls not taken can be routed to a secretary or to voice mail. System administrators define which extensions can have call screening, and end users can then define where unanswered calls are routed.

Automated attendants with an on-line directory feature enable callers to type in the name of the person they wish to reach in order to learn the extension. If an on-line directory is not provided or the caller is using a rotary phone, the system defaults to an operator if no command has been entered after a specified interval.

In addition, all automated attendants provide a dial zero for operator feature that enables callers to exit the automated attendant to speak with an operator. This is an especially important feature if the caller does not know the extension and an on-line directory is not provided.

IVR SUPPORT

Voice mail and automated attendant, while now basic, are enabling applications. Both paved the way for processing calls in a structured manner, a key attribute of IVR applications that support transaction processing by letting callers use the telephone keypad to enter, modify or retrieve data stored on host computers.

Mainly a function of high-end to mid-range products, IVR enables callers to order a product, verify airline flight departures or request a bank account balance. Prerecorded voice prompts or text-to-speech is used to communicate instructions to callers, confirm keypad entries and translate data from the computer into speech.

Supporting IVR requires the installation of host interface boards and terminal-emulation software that translates keypad commands to ones understood by the host computer. Most voice processors offering IVR support multiple host interfaces and host protocols.

High-end systems generally support all major host protocols including RS-232 asynchronous links to such computers as Tandem Computer, Inc.'s NonStop, Digital Equipment Corp. VAXes and even PCs. High-end products also commonly emulate IBM 3274 Cluster Controllers providing connection to IBM hosts and IBM 5252 Cluster Controllers providing a link to IBM System 36, System 38 and Application System/400 minicomputers.

Popular IVRs include AT&T Global Business Communication Systems' Conversant Voice Information System, Perception Technology's Vocom V, Periphonics Corp.'s VPS Series and Syntellect's Premier product family. Those products blazed a trail in IVR and were expanded to support other voice-processing applications.

Robust IVR applications can automatically log on to and off of host computers as calls require, automatically recover from a host failure, detect when the host is down and be able to keep the voice processor-to-host link alive.

Unlike voice mail and automated attendant applications, IVR requires a bit of data software programming know-how. While voice mail and automated attendant applications can be readily loaded onto a voice processor and start running with little or no modification, IVR applications most often have to be programmed from the ground up and conform to host database management system rules. This programming requirement forces end users to be well schooled in host environments or seek help from outside sources.

Alternatively, a growing number of voice processor vendors provide easily customized off-the-shelf IVR applications for vertical markets. For instance, Apex Voice Communications, Inc.'s OmniVOX, Communications Specialists, Inc.'s ScriptWrite and Granada Systems Design, Inc.'s TelGEN products provide a library of prewritten applications that include bank account inquiry, data entry and order entry. These products also provide a set of application generation tools that enable users to customize the prewritten applications.

FAX PROCESSING

Another leading application is fax processing. Enabled by the installation of a fax processor board and associated software, fax processing makes it possible for callers to send and receive fax messages and documents by entering commands on a telephone keypad.

Fax processing capabilities are increasingly being integrated or combined with IVR, voice mail and other voice processor-based applications.

For instance, callers can respond to voice prompts asking them to select which of a series of stored documents they would like sent to their fax machines, a process known as fax-on-demand. A wide array of documents can be made available by fax-on-demand applications, including price lists, product information sheets, account statements, transaction confirmation notices, brochures, promotional offers, diagrams, maps or any other faxable document.

Likewise, callers can instruct the voice processor to fax a copy of a particular document to all the parties on a distribution list using a fax broadcasting application. Lastly, callers can use a fax mail application to redirect a fax message to a designated fax machine.

Vendors, such as Comverse Technology, VMX, AT&T and Digital Sound have added the enabling fax and modem circuit cards, upgraded operating system and fax-related application development software to their platforms, essentially as new modular components. It is also possible to upgrade some existing systems from these vendors by purchasing these components separately.

For example, VMX's integrated Fax Mail Plus offering includes an integral Fax Application Processor (FAP) module that supports as many as eight fax ports. This module can be installed in any unoccupied slot in the VMX 200 or VMX 300 system cabinet. The VMX 200 can support as many as three FAPs, while the VMX 300 can handle as many as six.

Add to this an updated operating system and application software— D.I.A.L. Software Release 7, and Fax Mail Plus, in VMX's case- and fax mail integration, fax overflow management and limited fax-on-demand features are deliverable. For full-featured fax-on-demand applications, VMX offers FaxAccess, a dedicated fax-response application software package.

Continued on page 65

Fax-on-demand applications

With fax-on-demand, callers use a telephone keypad to request transmission of documents such as:

- Bills of lading
- Car loans
- Credit card authorizations
- Credit forms
- Circuit diagrams
- Insurance applications
- Invoices
- Price lists
- Product specifications
- Purchase orders

SOURCE: ROBINS PRESS, RIVERDALE, N.Y.

Continued from page 64

By contrast, Octel adds fax processing to its voice processor with a proprietary adjunct processor called the Voice Information Processing Server. Consisting of a separate voice processing and fax/data module communicating to the central cabinet via Octel's Command Language over X.25, this enhancement provides for both voice response and fax processing capabilities on current Octel systems.

In addition, Octel's Powercall Session — a collection of voice response and fax software applications written for the server — is required to deliver these new features. For custom tailoring of PowerCall Session applications, Octel offers end users TransAct — a proprietary menu-driven application generator package.

TransAct personalizes PowerCall Session for individual departments and user groups, and runs on MS-DOS-based PCs. TransAct allows users to write scripts, gather information and perform other necessary set up tasks using simple fill-in-the-blank screens, menus and context-sensitive help messages.

The logic of this voice/fax integration trend is compelling. Voice processing, with its natural user interface push-button keypad empowerment, provides a perfect front-end to fax processing applications by delivering ease-of-use and flexibility to the process.

Some of the benefits include the ability to select a variety of documents from voice menus and choose transmission options, such as time of delivery, receiving fax machine, and standard or fine resolution. Other major benefits are the ability to append voice messages onto fax message notifications and to transfer to other voice processing applications on the same call, such as leaving voice messages or transferring to an extension via automated attendant.

It's important to know there are some limitations to integrated voice/fax processing compared to dedicated fax servers. In general, integrated platforms cannot support the high capacities — including the number of pages of fax documents that can be stored on the system, the number of fax ports and the size of distribution lists — that dedicated fax servers can.

The reason is partly due to the limited amount of available real-estate on the voice processing platform; disk drives, fax/modem circuit cards and memory modules all take up space. In addition, the voice platform must dedicate processing power to other applications.

Generally, voice processors that provide fax functions through a tight connection with a fax server — either their own make or from a third-party — will do a better job at providing fax applications able to support large numbers of users, such as required by fax service bureaus and certain promotional and marketing applications that attempt to serve thousands of people.

E-MAIL INTEGRATION

Even E-mail is getting integrated into voice processors. A good example of this trend comes from VMX. In a laboratory setting, VMX's integrated voice processing systems can be enhanced with specialized software and various enabling add-on fax and text-to-speech circuit cards to provide integrated E-mail message notification, text-to-speech, speech recognition, fax mail, fax broadcasting and fax-on-demand capabilities.

The VMX system can use text-to-speech to read an E-mail message to a caller who can then output that message to a fax machine. The addition of fax to an E-mail application offers an obvious and immediate benefit: E-mail messages can be delivered to any fax machine anywhere, a boon to end users on the road.

A more mundane and market-ready example of E-mail integration is offered by VMX's new e-Mailworks, a $15,000 prepackaged software product that provides cross-notification of voice and E-mail messages to users who subscribe to both types of messaging systems. Users are given header information about each new message and can hear E-mail message information from a mixed-media mailbox as well as see voice mail message information from the E-mail mailbox. e-Mailworks runs on VMX's D.I.A.L., VMX 200 and VMX 300 systems. It provides integration with DEC's All-in-1, as well as IBM's Professional Office System and OfficeVision E-mail systems.

IN USE

Some call it multimedia. Others call it mixed-media or integrated messaging. Whatever it's called, it's abundantly clear that voice mail has become just one aspect of a much broader system architecture — one that can support multiple voice, data and imaging capabilities as users look for systems to help them manage and consolidate disparate message mediums.

This trend toward integration involves marrying voice processing systems with associated voice processing and communication technologies, such as voice response, fax and E-mail.

One example of this trend comes from AT&T's Global Business Communications Systems' Conversant Voice Information System, which is being offered as a multiapplication platform incorporating the company's voice response system and Audix Voice Power voice mail system as a single unit. Other functions available on the system include fax pro-

cessing supported by the addition of a special fax interface module, speech recognition and text-to-speech.

Pier 1 Imports, a specialty retailer of decorative home furniture and clothing headquartered in Fort Worth, Texas, uses the Conversant Voice Information System to help customers find the nearest of its more than 700 locations in the U.S. The company's automated store locator service uses speech recognition to let callers use their voices to request the location of the store nearest them and fill out credit applications. The system can support up to 96 ports and 36 hours of voice storage on a PC-based platform enhanced with a passive backplane and dual-bus architecture that expands normal system capacity by providing more slots. It offers all three flavors of fax processing and a ScriptBuilder application generator as a $6,000 option.

The system handles nearly 4,000 calls a week, and the company has added a number of other applications. "We bought the Conversant system for the locator service and subsequently developed many other applications," says Travis Cook, Pier 1's manager of corporate telecommunications.

Ease of programming was a big plus for Pier 1. "Once the core application is set up, which in my case paid for the system, everything else is just a bonus," Cook says. "For example, the Conversant provides a voice listing of available jobs, which eliminated tedious work for the human resources staff. The system is also used for call routing. And we are developing another application for human resources that will involve text-to-speech technology."

The new application, Cook says, will make it easier to hand out employee references. "Because we hire many college students and part-time workers, we have more than 10,000 employee records," he says. "Other companies that want job references will be able to key in the individual's social security number, and the text-to-speech system will read back the employee name, date employed and date departed."

At Blue Shield of California, a VMX 300 system is employed for voice mail, call routing and a number of IVR applications, including eligibility verification and claims processing running off an IBM 3270 mainframe.

The VMX 300 was picked for its quality, scalability and migration-related considerations, says Fred Mann, telecom coordinator for Blue Shield's Fulsom campus.

"The fact that VMX professed to be developing advanced capabilities like fax and E-mail integration was a major reason the system was purchased," Mann explains. "Although we're not using these capabilities right now, it's good to know they are available. Right now, we're taking a hard look at electronic claims processing with Electronic Data Systems. If that doesn't get off the ground, we just might look at fax-on-demand as a way to provide this application."

Alison Schrupp, manager of Blue Shield's Managed Care Center, which is responsible for HMO claims processing and customer service, doesn't want to wait. "With our eligibility verification application, many of our 1,400 daily callers still want a fax confirmation of their eligibility, even though they get a verbal confirmation from the system," she says.

"The current problem for us is that users get their verbal confirmation through the system, but then they press '0' on their keypad to get to a representative to get the fax confirmation," Schrupp continues. "In essence, we end up handling that inquiry twice. An integrated fax application would help us a great deal, and I could easily quantify that. If I had the budget, I'd buy it tomorrow."

With such trends surfacing, it's evident that the border between the telephone- and computer-based worlds is blurring, and that any distinction between them is temporary.

From the voice/fax processing perspective, there is a clear path of migration from voice-only interfaces to a more mixed-bag approach, with the computer — oftentimes a PC — playing the luggage rack.

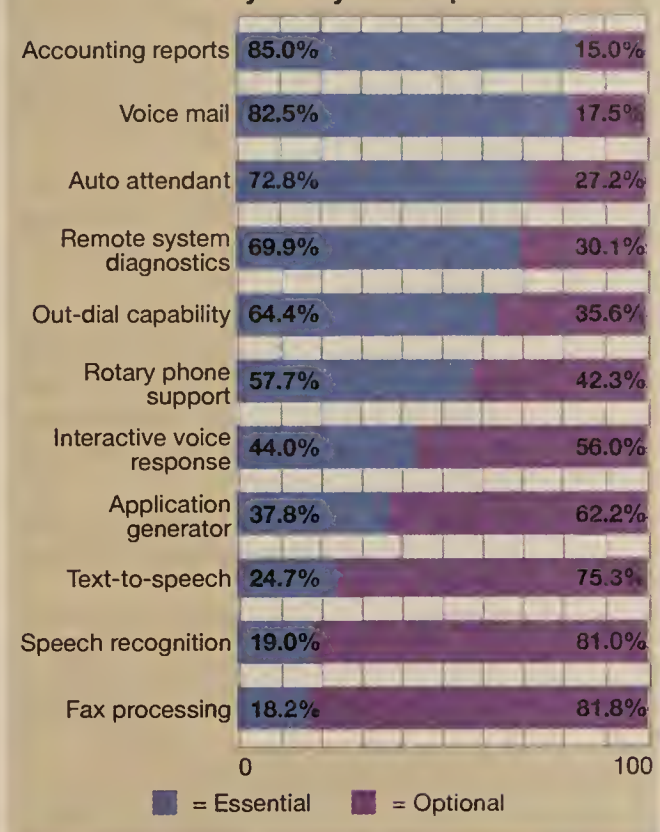
The implications of this are tantalizing, to say the least. Business communications could be transformed by ubiquitous multiwindowed videoconferencing and drastically simplified access to all types of information- competitive and otherwise. It truly is a brave new world.

➸ Robins is president of ROBINS PRESS, a publishing, market research and consulting firm specializing in voice and fax processing technology. He can be reached by phone at (718) 548-7245 or by fax at (718) 548-7237.

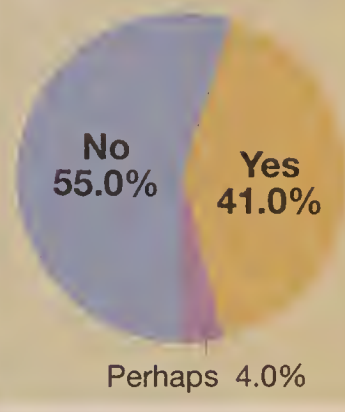
Reader views on voice processing systems

Based on 100 interviews.

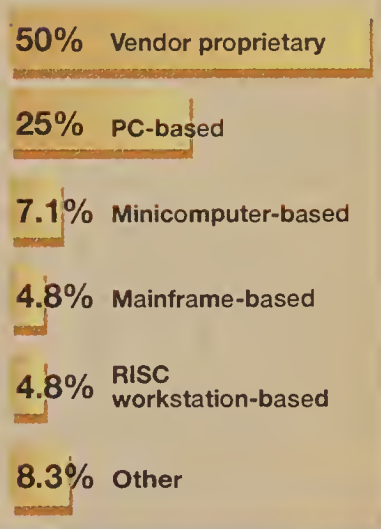
Which features are essential in a base voice processing system? Which would you buy as an option?



Do you plan to use a voice processing system to provide a unified messaging platform to access and manage fax, voice and E-mail messages?



Which platform does your voice processing system run on?

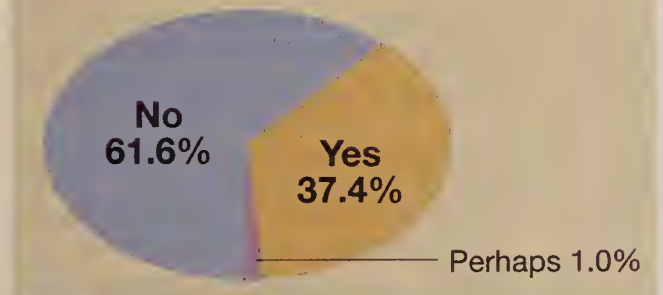


Key service and support issues

Based on highest possible score of 3.

On-site service as part of warranty	2.12
Free software upgrades	1.44
Ease of installation	1.24
Toll-free hot line	1.18

Is/will your voice processing system be linked to a host computer?



The information in this graphic illustrates key findings of a recent *Network World*/ Focus Data, Inc. reader survey. Focus Data, an independent market research firm in Framingham, Mass., conducted the survey and tabulated the results. For more information on Focus Data services, call (508) 626-2556.

GRAPHIC BY SUSAN SLATER

Voice processing security

A user reports that his voice mail password has suddenly stopped working. An irate customer complains of an obscene greeting when trying to reach the sales department. An office manager questions an 80% increase in long-distance charges.

These and other security-related problems have increased along with the growing use of voice processing systems and services. Hackers erase voice prompts and messages, change voice mailbox passwords, and leave harassing messages. Such terrorist campaigns can cause huge losses and damage customer relationships.

The Communications Fraud Control Association puts toll fraud costs conservatively at $1.2 billion per year. A recent *Forbes* magazine article put that number at over $4 billion.

To respond, voice processing system manufacturers are building better security into their products. Randomly generated passwords and failed password attempt monitoring are two basic examples of security-minded engineering.

Here's what leading voice processing vendors are doing to beef up security:

■Octel Communications Corp.'s Compass Technology division has engineered three levels of passwords for both the systems administrator and end users into its systems. At the administrative level, a rudimentary password can be used to print out a system activity report, a low-risk function. A higher level and more intricate password is needed to add or delete a mailbox, a higher risk activity. A still greater risk lies in modifying system parameters, so this type of activity has the highest level of password protection.

Octel also offers a self-destruct feature that erases all voice mail messages in a mailbox if the end user forgets his password. This self-destruct feature requires that the systems administrator delete and then add the mailbox again. This feature ensures that a hacker looking for information cannot get into user mailboxes from the systems administrator's extension without destroying everything in the mailbox first.

Other Octel security measures include the generation of a random, six-digit number when a new mailbox is created. One- or two-digit standard default passwords are not used. The company also offers an access-security feature that plays the time of the previous mailbox access when users log on to check messages, enabling the user to know if someone else accessed their mailbox.

Finally, Octel uses a nonstandard modem for its remote maintenance port. The modem has proprietary signaling and is not commercially available, eliminating the back-door method of access for hackers.

■Northern Telecom, Inc.'s Meridian private branch exchange systems that support Meridian Mail offer telephones with LED displays that show the caller what number they have dialed. Unfortunately, these same LEDs will also display a user's password when they log on to voice mail. Northern Telecom says it has engineered a fix that blanks out the password from the LED display and that it will be available shortly.

■Digital Sound, Corp. offers a voice recognition feature as an enhancement to password security. Users must speak their password when logging on. The system uses speaker-dependent speech recognition technology that distinguishes the authorized user's voice from others.

M. Robins

Comments

To comment on this or any article, drop us a fax at (508) 820-3467, call (800) 622-1108, Ext. 487, or message us via Internet at network@world.std.com.

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Kim Schackel, CBC, National Acct. Mgr., Western Region
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Help desk

Continued from page 2

the connection will not work properly.

Datagrade cable should have the following pin pairings: Pair 1 corresponds to Pins 4 and 5; Pair 2 corresponds to Pins 3 and 6; Pair 3 ties into Pins 1 and 2; and Pair 4 ties in to Pins 7 and 8.

Also, if your site is using RG-62/U 93 Ohm coaxial cable with Arcnet, then you will need to rewire with RG-58/U 75 Ohm coaxial cable for Ethernet.

I am trying to find a modem (2,400 bit/sec to 9.6K bit/sec) that is an "originate only" modem (for example, designed to deny the answering of all incoming calls).

This is a security issue, and I do not want a modem that can be reprogrammed.

The inherent design and manufacturing process (hardware) must assure the "one way out" call origination.

Dennis McIntyre, St. Louis

Michel Kabay, director of education at the National Computer Security Association replies:

Multi-Tech Systems, Inc. of Mounds View, Minn., manufactures modems, which have hardware switches for originate mode.

There are three different models available with a front-panel switch, which completely disables all software-driven AT commands. When commands are disabled, another switch lets you force the modem into originate-only mode.

Under these circumstances, you would have to dial the outbound number manually on a telephone connected to the modem. Model 224BA (2,400 bit/sec) costs $449, Model MT932BA (9.6K bit/sec) costs $749, and Model MT1432BA (14.4K bit/sec) is $799.

For more information on these modems, call (800) 328-9717 or (612) 785-3500.

LAN Server

Continued from page 49

interface (Presentation Manager). If LAN Server-Advanced is to remain competitive with today's more sophisticated NOSes, future versions must replace those character-mode utilities with utilities that work with Presentation Manager. A single logon service or, better yet, a true global directory service would help LAN Server-Advanced's cause.

As it is now, LAN Server-Advanced, with its relatively simple security and access control features, may be an adequate fit for small to midsize nets but will not do well in larger sites requiring more sophisticated NOS features.

Gibbs is a writer, analyst and consultant based in Ventura, Calif. He can be contacted at (805) 647-2307, through CompuServe (mhs:mgibbs@gyre) or on the Internet (mgibbs@rain.org).

Letters

Two assets

I really enjoy *Network World* and look forward to every issue. The content is relevant and timely. Two items in the Dec. 20, 1993, issue were especially helpful to me in my position as an information services planning coordinator for an electric utility company.

Dana Thorat's response in the Network Help Desk regarding how to gain access to the Internet and which criteria to consider when choosing an Internet access provider (page 2) really hit the spot for me.

Because of her scoop, I was able to send an electronic mail message to info-deli-server@netcom.com and get a current list of national Internet service providers, as well as subscribe to receive future updates of it. Who knows when, or if, I ever would have come across this information without Dana.

My favorite article was Mark Gibbs' "MIS Realities 101" (page 18). I E-mailed him to let him know how much I appreciated it, and, shortly thereafter, he took the time to reply.

I vote to keep Dana and Mark on the payroll. They're both assets to your publication.

Bobby Beall
IS planning coordinator
Central Louisiana Electric Co., Inc.
Pineville, La.

MIS realities

Mark Gibbs' "MIS Realities 101" are lessons that those of us in the trenches know only too well. Lesson No. 2 strikes a particularly sore point; I would much rather give up Simple Network Management Protocol capability in my next network hub and the dust-collecting SNMP monitor for a few relevant training classes.

In today's downsizing environment, the network and the people that support it are not recognized as being nearly as important to the business as the corporate mainframe. The network-based solutions today represent merely economical alternatives to mainframe-based solutions instead of being regarded as the strategic choice in a competitive environment.

David Pagenkopf
Network analyst
Information Systems Department
University of Wisconsin Hospital & Clinics
Madison, Wis.

Leap of logic

A word of caution to editors, proofreaders and systems operators trying to "hurdle" along the information superhighway (*NW*, Dec. 27, 1993/Jan. 3, 1994, page 1): You'll probably break your neck leaping over the potholes. Try "hurtling" instead. It's faster, safer and provides quite a rush.

Richard Abrahams
Marketing communications director
Storage Computer Corp.
Nashua, N.H.

I hope for your sake your statement about "hurdling along the information superhighway" isn't an omen of things to come in 1994. Surely you meant to take readers on a ride "hurtling" along the information superhighway. How does one fasten a seat belt and leap hurdles at the same time?

You did redeem yourselves with the content of the issue, which was interesting and informative, as usual. Better luck next time on the headline.

Ellen Hamblet
Network manager
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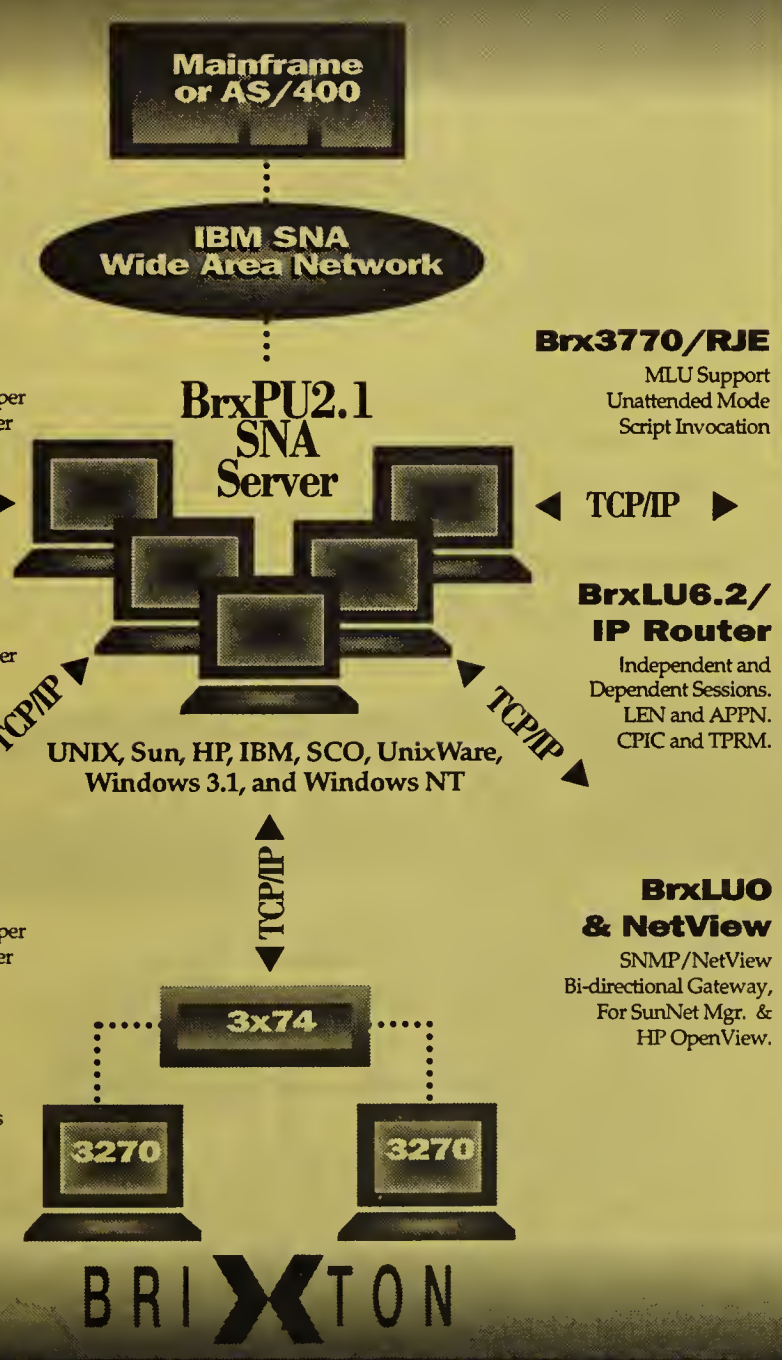

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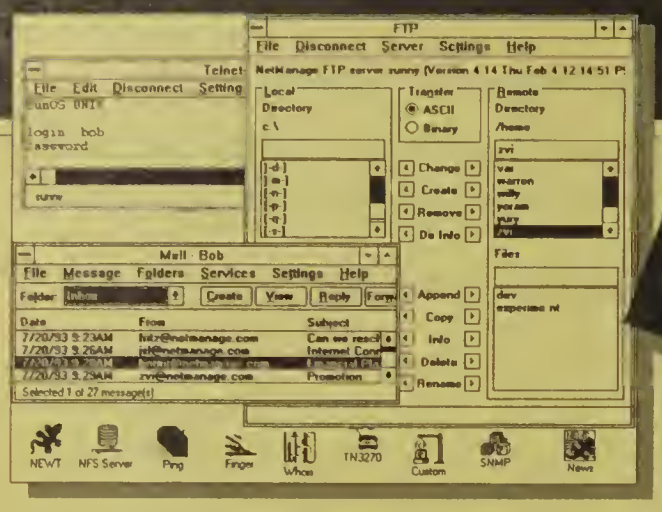

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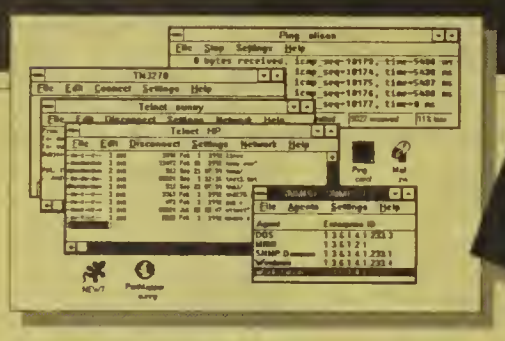

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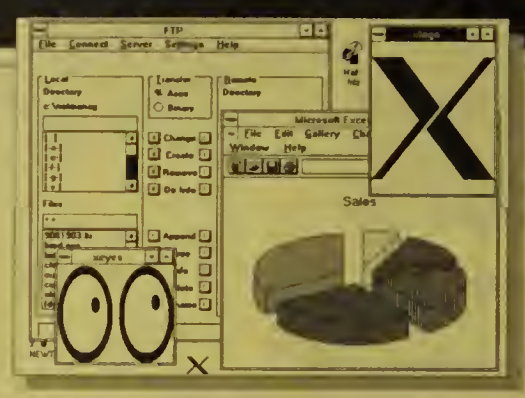

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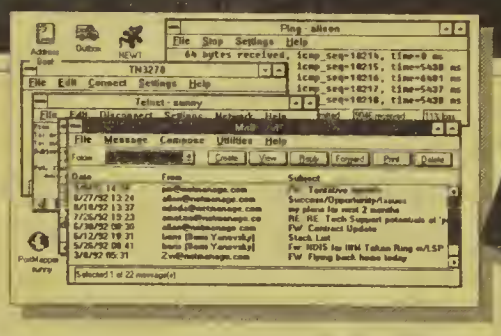

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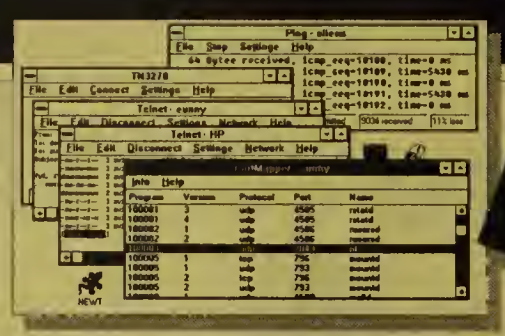

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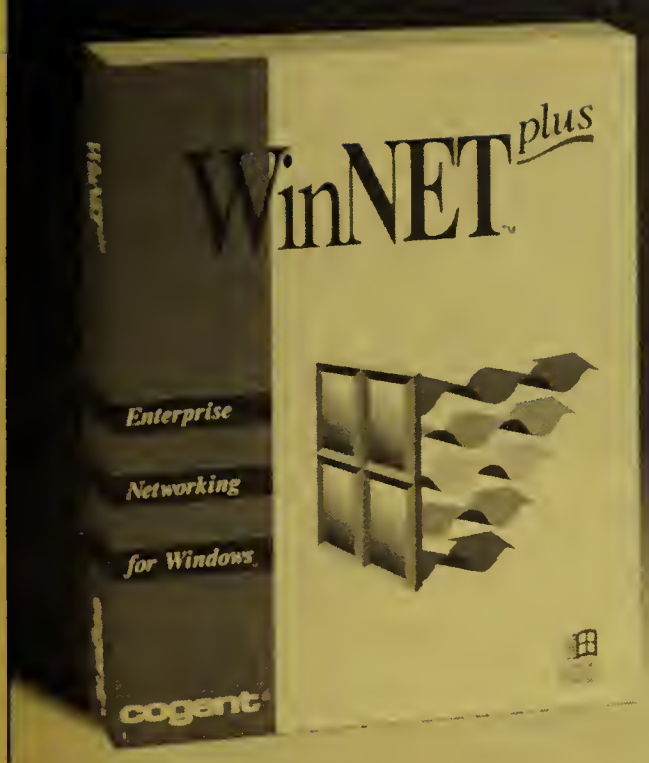

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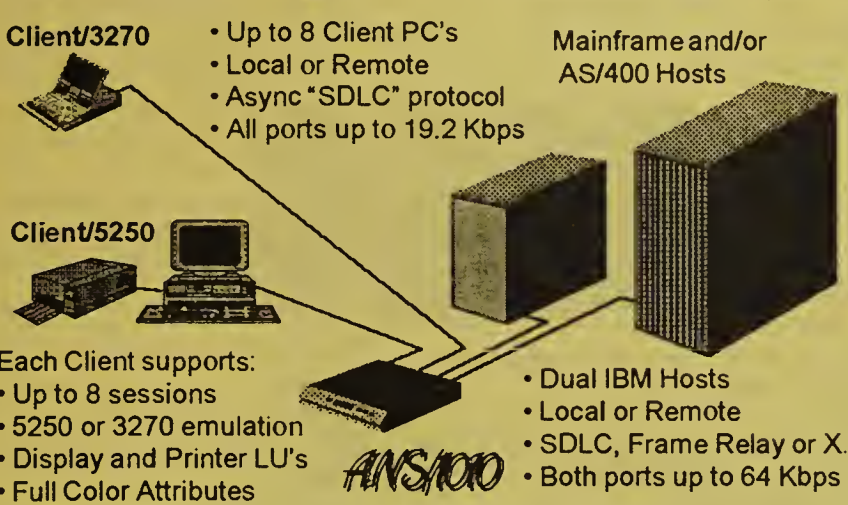

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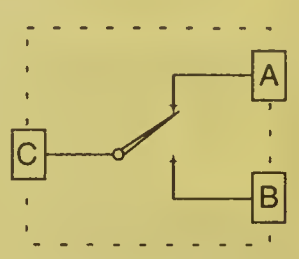

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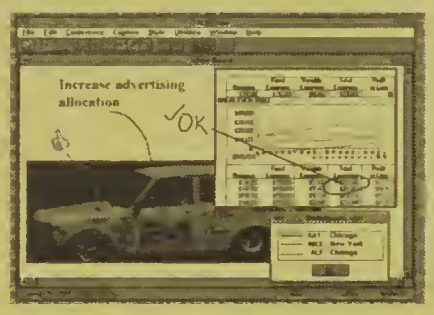

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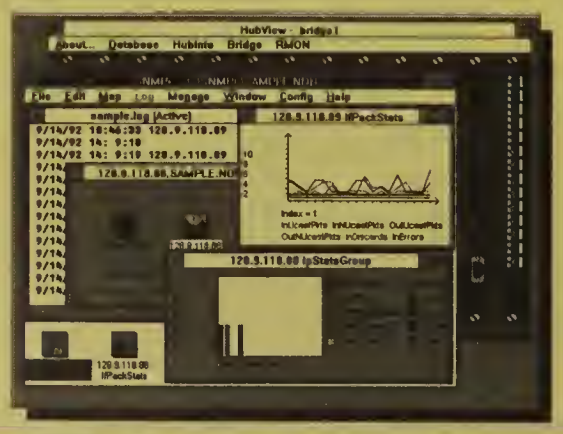

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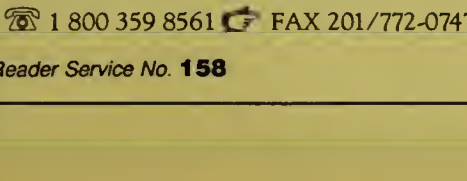

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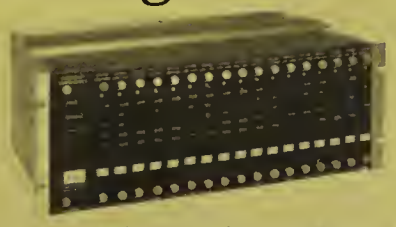

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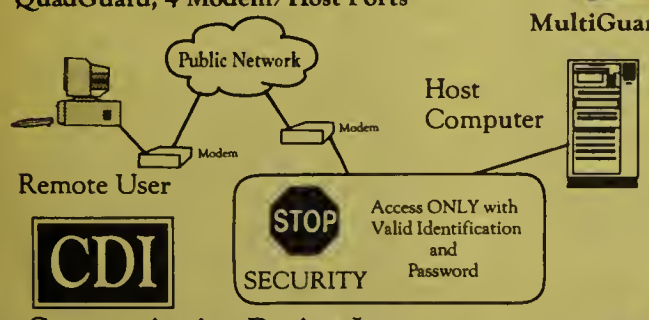

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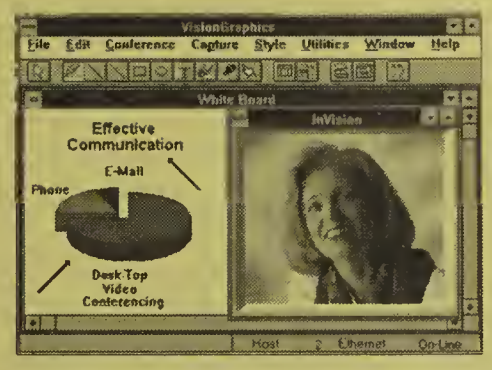

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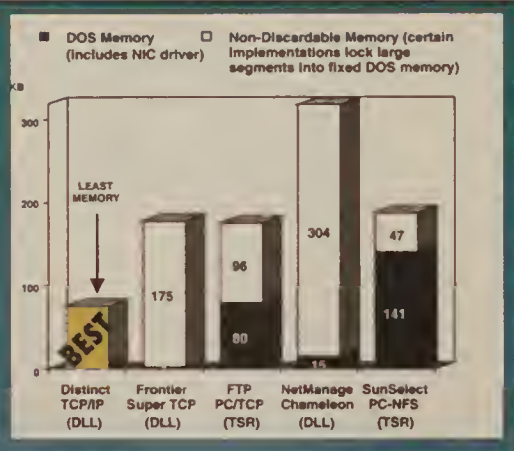

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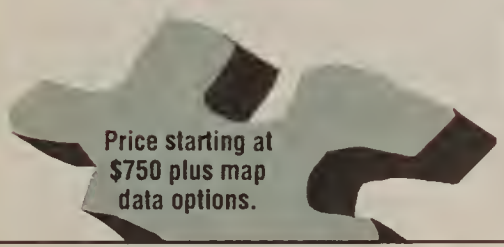

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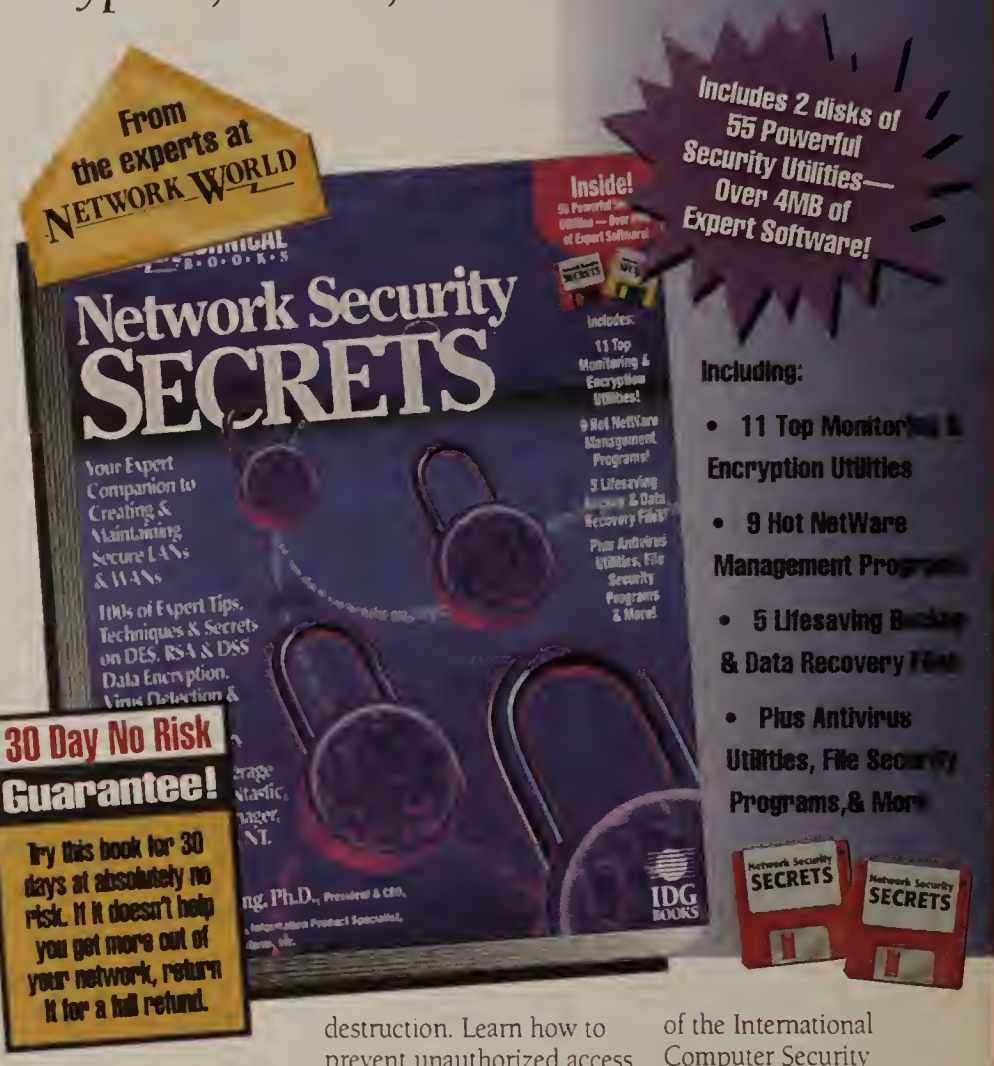

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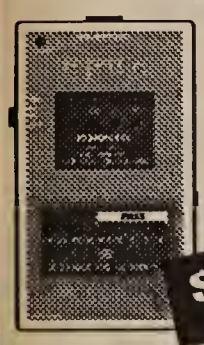

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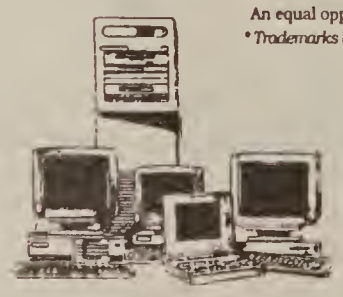

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Marcie Wheeler

Marcie Wheeler
Specialty Services Recruiter

Bells and GTE team with MCI for national SMDS trial

BY DAVID ROHDE

Washington, D.C.

The five regional Bell holding companies that offer Switched Multimegabit Data Service (SMDS) are joining with MCI Communications Corp. to test a nationwide SMDS network starting next month and hope to have a nationwide service available by June.

The group, which also includes GTE Telephone Operations and Bell Communications Research, have formed the SMDS Inter-Carrier Interface Consortium.

It will discuss plans for the trial at a ComNet '94 press conference here on Tuesday.

Partly because MCI is the only major long-distance carrier to offer SMDS, the service traditionally has been viewed strictly as a LAN-to-LAN service within metropolitan areas.

"I have wanted inter-LATA SMDS for as long as SMDS has been available," said Ted Sickles, manager of data networking for Rockwell International Corp. in Seal Beach, Calif. "There aren't that many businesses that are based within LATA boundaries."

Inter-local access and transport area SMDS would be especially attractive for inter-enterprise connectivity among different businesses, Sickles said. "In aerospace, we typically team with other aerospace companies," Sickles said. "In our automotive business, we want very much to design with our customers."

Test participants are touting SMDS' connectionless feature, which precludes the need to pre-define virtual circuits.

"Currently, there is no switched broadband service that is able to transport network traffic throughout the U.S.," said Arnie Eizensmits, manager of fast packet services for GTE Telephone Operations, which made the announcement here.

Not all observers see the need, though. Tom Nolle, president of CIMI Corp., a consulting firm in Voorhees, N.J., questions the demand for national SMDS.

The main benefit of SMDS is "providing lower cost access to a large number of sites within a metropolitan network," Nolle said.

Inter-LATA SMDS would probably be no less expensive than existing leased-line and virtual networks, Nolle contends.

But he credits the announcement of a national trial as removing "a political barrier to SMDS acceptance."

Ability to support inter-LATA SMDS will become a standard question for users bidding out contracts, he predicts. "It'll probably get a lot of ticks on RFPs," Nolle quipped.

The consortium's trial network will include SMDS connections in Atlanta, Chicago, Dallas, Philadelphia and San Francisco. The connections will be handled respectively by BellSouth Corp., Ameritech, GTE Telephone Operations, Bell Atlantic Corp. and Pacific Bell. US West also is part of the consortium.

NYNEX Corp. and Southwestern Bell Corp. do not offer SMDS.

Manufacturers supporting the consortium's efforts are AT&T Network Systems, DSC Communications and Siemens.

Rescue

Continued from page 1

mainframe over high-speed wide-area networks.

Components of the new CISs are already on-line in Alberta and are working well.

All three utilities began looking to replace their CISs in the late 1980s. The IBM and Amdahl Corp. mainframes they used were growing more difficult to maintain, and were frustrating efforts to give workers and customers access to data.

"We recognized that we were living on borrowed time [by relying on our current mainframe-based customer information system]."

Kees Vreugdenhil
Director of information resources
Union Gas, Ltd.

"People used to be satisfied just to get a bill in the mail," said Kees Vreugdenhil, director of information resources at Union Gas. Today, however, consumers want information on how much gas they use each month, something impossible to glean from the current systems. Existing systems also make it hard for the utilities' marketing departments to gauge trends and develop new services, he said.

When B.C. Gas hired Thomas Young as vice president of management information services, he agreed to make a new CIS his top priority. In February 1990, a few weeks after Young's appointment, an acquaintance named Ted Barnacle called to offer his congratulations. Young told Barnacle, who holds a similar position at a subsidiary of Canadian Western, what he wanted to do.

"Isn't that interesting?" Barnacle replied. "I'm doing the same thing."

They decided to try working together to cut costs.

At the same time, Vreugdenhil was heading a Union Gas task force coming to the same conclusions as the other utilities. The task force considered buying or adopting a CIS from another gas utility, but it could not find any that would give the company the power it needed for managing and manipulating information across a net. Four years ago, Vreugdenhil said, large-scale client/server applications were in their infancy.

He heard about Young and Barnacle's work and contacted them. Once they agreed to work together, convincing senior management to sign off was relatively easy, given the high cost of going it alone.

The users said the consortium is working because the three utilities have much in common, including a belief in client/server. And all of the companies have customer bases between 600,000 and 650,000.

Today, some 100 programmers at each of the sites are working on 19 major application components, broken down into roughly 5,000 programming modules. Much of the work relies on Cobol development tools and frame libraries — equivalent to Smalltalk or C++ class libraries — from Netron, Inc. of Toronto.

The effort also involves computer-assisted software engineering tools from Bachman Information Systems, Inc. and KnowledgeWare, Inc., Vreugdenhil said. The use of Cobol will let each company's existing programmers stay on the job.

The work is being overseen by a steering committee of both information technology and end-user representatives from each of the utilities. They meet once a month, taking turns as hosts.

"Communication is very important," Young said. "Of all the large projects I've been involved in, very few have failed for technical reasons."

Vreugdenhil said the new systems will likely not mean any short-term savings. In the long run, they could lead to new revenue as marketers use data from it to develop new services, he said. The improved CISs will also lead to improved customer relations.

Frame relay

Continued from page 1

required 56K bit/sec or higher speed private lines.

Currently, businesses primarily use frame relay as a leased-line replacement, Kapoor said. By allowing temporary connections, the switched standard should make frame relay economical for new applications, such as connections between companies.

Frame relay takes hold

	Number of users	Ports in service
Jan. '93	124	789
Jan. '94	676	6,972

SOURCE: DISTRIBUTED NETWORKING ASSOCIATES, GREENSBORO, N.C., AND FRAME RELAY FORUM, FOSTER CITY, CALIF.
GRAPHIC BY TERRI MITCHELL

Dennis Krysmalski, a senior manager with Deloitte & Touche in Atlanta, said SVC-based frame relay will also be useful for private-line backup. In high-capacity ap-plications, such as router-based internetworks, backup circuits can get too expensive to be practical, he said. Switched frame relay would make a good alternative to the standard 9.6K bit/sec dial-up recovery links.

The flexibility of SVC-based services appeals to Tom Jones, president of New Venture Directions, Inc., a consulting firm in McLean, Va.

PVCs require customers to order links by choosing end points and specifying speeds, and changing those parameters requires notifying carriers during business hours. "Planning frame relay nets today is very much like planning a leased-line net," Jones said. "They are static and, once implemented, you only want to change them a few times per month at the most."

In contrast, SVCs will let users select destinations and negotiate CIR and burst rates at connection time by using their customer premises equipment to pass signaling information into the carrier cloud using a standard protocol that specifies call establishment parameters.

Jones believes SVCs will be particularly important to companies that need thousands of connections. "Some X.25 nets today rely on switched virtual connections. Transaction nets might find they can take advantage of frame relay to get more throughput for the money."

Some analysts are skeptical of SVC offerings. Tom Nolle, an analyst at CIMI Corp. in Voorhees, N.J., said today's routers are poorly equipped to handle switched connections. As a connection is set up or torn down, the change will trigger cascades of routing table updates throughout frame relay nets.

"Most router nets today work on the presumption of largely continuous availability of all destinations," Nolle said. Switched frame relay will "introduce a class of service that is only useful to somebody who's relationship with everybody else doesn't meet the fundamental dictates of a router network."

AT&T's Jayne Fitzgerald, a product-line director for the firm's data services, agreed that customer premises equipment vendors face a lot of implementation work. Even though an implementation standard has been agreed to, much must done before carriers can offer SVC services, she added.

Steve Taylor, an analyst at Distributed Networking Associates in Greensboro, N.C., said he doubted that implementing switched frame relay would be a difficult technical hurdle since the industry crossed a similar barrier with switched X.25 about 15 years ago.

Carrier support for the new service appears fairly strong. Companies planning to provide the new service include Bell Atlantic Corp., Cable & Wireless Communications, Inc., NYNEX Corp., Pacific Bell, Southwestern Bell Corp., Sprint Corp., Unitel Communications, Inc. and WilTel, Taylor said. AT&T has the service on its radar screen, but wants to see how demand develops, Fitzgerald said.

NETWORK WORLD

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Service

Continued from page 1

training and education. Vendors would be wise to heed user concerns because service has become a key differentiator for users when choosing a supplier.

"More users are viewing products as interchangeable, so provider decisions are being made more often on a manageability level," said Jeffrey Kaplan, director of Dataquest Worldwide Services Group in Framingham, Mass. "Service and support is starting to carry more weight than technologies supported or product feature suites."

As Figure 2 on this page shows, more than a third of the 314 users surveyed say they'll dump one or more of their current suppliers because they're unhappy about service and support.

"Vendors need to look at that and realize that service and support is a pivotal issue," Kaplan said.

Kaplan said willingness to switch suppliers is often based on how disruptive it would be to swap out one vendor's product for another.

"Users are most likely to switch modem vendors, for example, because modems can be swapped out with relative ease," he said. "On the other hand, users are less likely to replace complex devices such as PBXs because that would wreak havoc with the network."

SATISFACTION SNAPSHOT

As a baseline, users were asked to rank the importance of various service and support capabilities. Figure 5 on page 82 shows the overall importance rankings, with response/resolution time and quality of phone support topping the list.

"Users do not want to get caught up in the sexy, high-technology areas such as remote monitoring of the net," Kaplan said. "They want to focus on the fundamentals and get problems resolved in a matter of minutes or hours, not days or weeks."

That's a reflection of how important the network has become in meeting strategic business goals.

"Our primary function is to generate unemployment checks for the state of Indiana, and our network is the most critical tool in that process. We can't afford downtime," said Tom Alyea, network manager for the state of Indiana in Indianapolis. "For a number of major vendors, response times are their biggest problem. I've found that smaller companies are more willing to make the effort."

Excessively long response time has forced the University of Illinois in Champaign to bring some support services in-house. "With the exception of two suppliers, the service we're receiving has gone downhill so rapidly that I've been forced to handle a number of issues, especially those related to software, in my department," said Gary Brinkley, associate director of information systems at the college. "I don't know how these companies stay in business."

Because it was so difficult to get support from some of his software suppliers, Brinkley was forced to hire three application developers to generate the software fixes he needed.

"It was more cost-effective for me to make those hires in light of the time and money I was losing due to the poor level of service I was getting," he said. "After we brought those developers on board, we started getting turnaround times on software fixes of one hour as opposed to 40 days when we went through our suppliers."

In addition to ranking key support issues, users were asked to score their current vendors on quality of service. Figure 1 on this page shows how users rated 13 types of LAN, WAN and internetworking equipment as well as software and WAN services for overall satisfaction with service and support. The average scores ranged from a low of 3.6 for database management systems to a high of 4.1 for both hubs and local-area network adapter cards.

Users who gave vendors a low score for service and support were then asked to choose one area in which the supplier most needed to improve (see Figure 4, page 82).

Surprisingly, lowering the cost of service was not the top concern for users of any product. Easier installation and ease of use was the top area of improvement recommended for software suppliers (DMBS, E-mail and network operating systems), as well as hub, router and LAN adapter makers.

TOPPING THE LIST

Better on-site support topped the list for private branch exchanges and multiplexers, while modem and server/superserver vendors were told to improve telephone support. Ironically, users of private-line, 800 and virtual network services listed improved phone support as their chief concern.

In fact, telephone support was the No. 1 or 2 concern in 10 of the 13 product categories.

"When I get a vendor on the phone, I want to come away with a fix for my problem," Alyea said. "If that fix will be delayed because hardware needs to be shipped out, then I want a suggestion for a work-around."

Improving telephone support means not only adding lines and personnel, but also improving the quality and technical expertise of the individuals staffing the help desks, said K.C. Okada, systems manager at Carondelet Health Services in Tucson, Ariz.

"Many times, the person at the other end of the phone wrongly assumes they're talking to someone who has no networking knowledge," he said. "They end up talking down to the caller and suggesting things that were already tried. Instead of getting helpful suggestions, they tell you to try something again and call them back. That is just not acceptable."

One network manager from a large manufacturing firm who requested anonymity expressed frustration about dealing with Microsoft Corp.'s service personnel over the telephone. The user, who maintains a sophisticated Windows network with over 1,000 nodes, was installing a new Windows-compatible sound system on a series of Compaq Computer Corp. machines when he ran into a glitch.

He placed a call to Microsoft and was asked if he had a corporate support contract with Microsoft. When he said he didn't, the Microsoft representative terminated the call. After several more telephone calls and threats to take his business elsewhere, the user managed to get the multimedia extensions he needed to implement the sound systems.

"Microsoft just doesn't have strong service and support offerings, especially for large enterprise environments," the user said. "It would be easier for me to get pregnant than it would be to dredge information out of them."

That Microsoft situation is indicative of what happens to companies as they get bigger and more successful, said some users.

"Once a company gets to a certain point in their growth, they get a little cocky and start to lose touch with their customer base and take them for granted," Brinkley said. "Some expand so quickly that they get consumed by sales and warehousing issues, and customer service loses out. In the long run, they're the ones who'll lose out because I won't go back to them when it's time to upgrade. Apple

How satisfied are you?

Figure 1

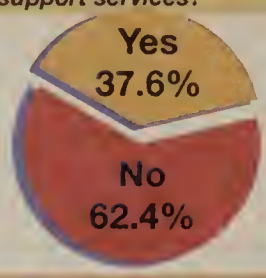
Users were asked to rank their level of service/support satisfaction for the following products, with 1 being not at all satisfied and 5 being extremely satisfied. These are the percentage of the 314 users who rated these services.

Product line/ Network services	Mean score	1	2	3	4	5
Hubs	4.1	.4%	4.2%	14.0%	47.7%	33.7%
LAN adapters	4.1	0	4.1	13.1	50.0	32.8
Routers	4.0	.4	6.0	18.1	45.7	29.8
Servers/Superservers	4.0	0	3.0	20.7	48.7	27.7
LAN operating systems	3.9	.4	6.0	19.5	53.2	20.9
Modems	3.9	1.1	4.3	26.0	43.3	25.3
Multiplexers	3.9	1.4	1.9	24.9	51.2	20.6
PBXs/Key systems	3.9	.7	6.8	25.3	37.7	29.5
Toll-free service	3.9	0	2.9	24.6	50.4	22.3
E-mail	3.8	1.2	9.2	23.9	41.4	24.3
Private-line services	3.8	.4	6.7	24.4	44.9	23.6
Virtual private networks	3.8	1.6	3.9	27.6	44.1	22.8
Database management systems	3.6	2.0	6.9	30.7	45.0	15.3

Mad as hell

Figure 2

Will you switch any of your current vendors because of your dissatisfaction with the quality of their support services?



Of those users who said they would switch, modems led the list of likely products/services where the change would be made.

Product line/ Network services	Percentages
Modems	14.1
LAN operating systems	10.6
Electronic mail	10.6
Routers	9.0
Servers/Superservers	8.5
Private-line services	7.5
Multiplexers	7.0
LAN adapters	7.0
Hubs	7.0
Database management systems	7.0
PBXs/Key systems	4.5
Virtual private networks	4.0
Toll-free service	3.0

A single point of contact

Figure 3

Are you interested in having a single vendor provide multivendor support of your networking environment?

Among users who said "Yes," professional service vendors edged out the network equipment vendors in terms of preference.

Service/support provider	Percentages
Professional services/ systems integrators	24.4
Network equipment vendors	23.5
Computer systems vendors	20.2
Value-added resellers	16.0
Third-party management providers	7.5
Interexchange carriers	6.7
Regional Bell operating companies	1.7

GRAPHIC BY SUSAN J. CHAMPENY

Methodology

Telephone interviews for the "Network Service and Support Survey" were conducted in December by Dataquest Primary Research Group in San Jose, Calif., and analyzed by Dataquest Worldwide Services Group in Framingham, Mass., among a random sampling of *Network World* readers. Respondents were MIS or network managers involved in the acquisition of network products and services.

The average network budget at the 314 companies surveyed was $3.6 million, and the enterprise networks installed in these firms supported an average of 6,300 employees and 124 sites.

Dataquest Worldwide Services Group will be publishing a report titled "Network/Communications Support: User Wants and Needs" in the near future that contains more detailed information on the survey.

This survey...

...was conducted in conjunction with Dataquest Worldwide Services Group, a division of Dataquest, Inc., which is a market research and consulting subsidiary of Dun & Bradstreet Corp.

Dataquest Worldwide Services Group has tracked the worldwide information technology service and support industry for more than 10 years. The company offers several annual subscription services, which provide market studies, competitive analyses and customer research services that meet the needs of business planners, marketers and senior management at more than 100 leading information technology vendors in the U.S., Europe, Japan and the Pacific Rim.

Dataquest Worldwide Services Group can be reached at 550 Cochituate Road, P.O. Box 9324, Framingham, Mass. 01701-9234, or by calling (508) 370-5555.

Users demand action
Figure 4

Users who gave low ratings for service and support indicate where vendors need improvement. These are the percentage of users who rated each product:

Product/Network service	Easier installation and use	Better on-site support	Better telephone support	Lower cost for service/ support	Other
Modems	20.9%	17.4%	25.9%	21.0%	14.8%
Multiplexers	25.1	31.2	18.8	8.3	16.6
PBXs/Key systems	21.4	28.6	11.9	16.7	21.4
LAN operating systems	34.3	14.1	26.7	10.9	14.0
LAN adapters/Interface cards	36.8	7.9	31.6	2.6	21.1
Routers	30.6	16.3	24.6	10.2	18.3
Hubs	27.1	27.0	16.2	13.5	16.2
Private-line services	12.2	13.8	24.1	22.4	27.5
Virtual private networks	18.4	12.1	33.3	18.1	18.1
Toll-free service	16.2	16.1	32.3	22.5	12.9
Database management systems	39.3	10.6	25.7	4.5	19.9
E-mail	32.8	6.6	25.2	3.9	31.5
Servers/Superservers	15.7	22.8	28.1	15.7	17.7

GRAPHIC BY SUSAN J. CHAMPENY

[Computer, Inc.] is a great example. In the beginning, I used to hear from their rep a least once a month, but I don't think I've been contacted for about a year and a half now."

Service and support, however, is not just the responsibility of the vendors. Users also need to contribute to the process if it's going to work smoothly, Okada pointed out.

"Because of the proliferation of networks and lack of enough qualified individuals to run them, you run across more people who claim they know networking but really don't," he said. "They're clogging up the service and support channels with problems that even your most basic manager should be able to handle without intervention from the suppliers. Service and support is a two-way street where both vendors and users have rules to abide by."

One way to address that is through peer organizations and birds-of-a-feather user groups, Alyea said.

"Novell offers good service and support, but it could be better, especially in getting NetWare 4 up and running," he said. "What would really help would be access to other users who are implementing NetWare 4. Real-world experiences may be the most valuable tool in resolving nagging network problems."

Users had another suggestion on how to improve service and support: reduce the need for it by making products easier to install, use and maintain.

"Vendors need to make these devices as plug-and-play as possible and shield the users from as much of the inherent complexity as possible," Kaplan said. "That's a tall order, but ease of use translates into more sales. If a vendor could manufacturer a router that was self-configuring, users would be lined up for miles to get one."

PREPLANNED SUPPORT

In order to accomplish that, vendors need to start building serviceability into their products while they're on the drawing board.

"Vendors need to learn who their customers are and think about whether the features they're developing are really helping or not," said John Cronin, network director at Monsanto Co. in Ellisville, Mo. "Suppliers need to think products through real hard, so what goes out the door doesn't need to come back in a few weeks to be tweaked."

The complexity of products is becoming a bigger issue as networks grow in size. Those nets invariably include products and services from several different vendors.

The survey (see Figure 3, page 81) found that more than 40% of the users would be interested in having a single company provide support services for that entire environment — a fact Kaplan found surprising based on previous research.

"In previous Dataquest studies, that number ranged between 10% and 15%," he said. "It's a reflection that users are getting increasingly frustrated in dealing with so many vendors to keep the network up."

It's an area that will remain on users' wish lists for a long time given the physical limitations of any one vendor handling every aspect of service. "A single vendor would be utopia, but unfortunately not reality," Cronin said. "The market is just too dynamic for one company to keep track of everything out there."

"No one is really qualified to do that, so I'm better off letting the specific vendors handle their own products," added Darrell Rials, project engineer at the Halliburton Co. in Arlington, Texas.

Brinkley didn't have any interest for a different reason. "Bringing a single company in for support would be a problem because it would create a monopoly for that outfit," he said. "That means service and support would eventually decline because there would be no competition to keep that vendor honest."

In any case, suppliers have to work hand in hand with other vendors to help users resolve problems in multivendor environments.

Participation in multivendor alliances, such as Novell, Inc.'s Technical Support Alliance, was brought up by users in last year's survey as one of the top areas for vendors to address. That means suppliers have to invest in staff training on a variety of net platforms and applications and in forging alliances with other vendors for cross-training and support.

While many users would like single-vendor support if feasible, they continue to shy away from network outsourcing. In results similar to last year's survey, only 14% of the users surveyed have embraced outsourcing in the past year, with only an additional 4% indicating they will do so in 1994.

A majority of the outsourcing, 77.3%, happens on the data side of the net, with outsourcing of LAN functions almost 50% of that total.

"Users are only outsourcing selective pieces of their network and not the entire operation," Kaplan said. "That points to the users' apprehension of putting their most strategic business tool — the network — completely into the hands of an outsider. Users are likely to either outsource a complex portion of their net because it is too time-consuming to handle themselves or the more routine functions to free up time for the larger, more challenging issues."

Big concerns
Figure 5

When asked to list service/support areas in terms of importance, the 314 users surveyed ranked response/resolution time as their top concern.

1. Response/resolution time
2. Quality of telephone support
3. TIE — Ease of installation and use; Quality of on-site support; Quality of documentation
4. Cost of support
5. Service guarantees
6. Availability of self-support tools (for example, electronic bulletin board systems)
7. Length of warranty
8. Availability of remote network monitoring service by vendor

GRAPHIC BY SUSAN J. CHAMPENY

SUMMING UP

In general, the survey pointed to a number of service and support areas that vendors must bolster in order to meet user needs.

To get response times down, vendors should provide better training to their service and support staffs, especially those manning help desks or customer service hot lines. Spending a minute to discover the user's technical level can also help eliminate going over extraneous background material.

Suppliers also have to reduce the need for service and support by building reliability and availability features into products. Ease of use, ease of installation and designed-in reliability are becoming even more important as users extend their enterprise nets to smaller sites that don't have dedicated IS personnel.

That means rethinking development and design priorities — a potentially tough shift, but one that could increase a product's marketability and usefulness. It can also cut the cost of servicing the product.

Also, users say, vendors have to work with them to customize a service and support plan rather than shoehorning vastly different customers into the same basic offerings. This also means working more closely with regional suppliers, providing them with technical training and spare hardware parts to speed problem resolution. A local service option can make a big difference when the main vendor is in a different time zone or geographically distant from the net site.

Ultimately, the vendors need to commit more resources to their service and support areas and never take their installed base for granted.

"Success can be an intoxicating thing," Aylea said. "Just don't forget the users who purchased your products that made that success possible in the first place."

Paying the price for service

When *Network World* and Dataquest Worldwide Services Group conducted the "Network Service and Support Survey" last year, users said they did not expect to increase spending on service and support very much in the next two years.

In this year's survey, however, users indicated that network budgets and spending on internal staff would grow over the next 24 months, along with spending on external net service and support.

The average network budget at the 314 sites surveyed was set at $3.6 million for 1993, and almost 50% of the users expected that figure to increase by about 24% by 1995. Likewise, the internal network support staff size, which averaged 27 people in 1993, was expected to increase by 1995. Nearly 50% of the users surveyed indicated that their support staff would increase during that time by an average of 39%.

"Those figures are an indication that users would like to improve the utility of the technology they have in place rather than running out and buying more technology," said Jeff Kaplan, director of Dataquest Worldwide Services Group. "They realize that some of the problems they're experiencing in their networks aren't related to inadequate technology but existing devices not functioning correctly because the support services are not up to par."

While network hardware and software acquisitions led the 1993 network budget allocation breakdown with 43% of the total, in-house network support staff and outside network support services came in as the next-largest budget item, garnering 34.3% of the financial resources.

The majority of those resources being spent on outside support is earmarked for network implementation and integration services, followed by end-user support, operations and management, and planning and design.

In 1995, equipment and software purchases will decline somewhat to 40.1% of the budget, with service and support picking up the majority of that money, accounting for 36.4% of the projected 1995 budgets.

"While that shift may not seem significant, it reflects a pattern identified in last year's survey that users are placing more importance on support services," Kaplan said. "They are less concerned about cost because they're more concerned about the value and quality of their service."

And if the suppliers do not deliver adequate levels of service, users will be left to fend for themselves in that area.

"Customer support and technical help seems to be one of the first things that vendors cut back on when experiencing tough economic times," said Gary Brinkley, associate director of information systems at the University of Illinois in Champaign. "If vendors don't prioritize those cuts, it will force users to increase their internal support staffs to pick up the slack."

BY SKIP MACASKILL

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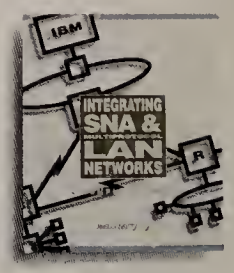

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